

# UNIVERSITY OF VIRGINIA – CHARLOTTESVILLE



(NASA-CR-140036) ENVIRONMENTAL  
APPLICATION OF REMOTE SENSING METHODS TO  
COASTAL ZONE LAND USE AND MARINE  
RESOURCE MANAGEMENT, APPENDICES (Virginia  
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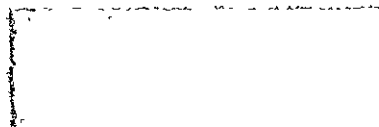
Interagency Report USGS - 243

ENVIRONMENTAL APPLICATION OF REMOTE  
SENSING METHODS TO COASTAL ZONE LAND  
USE AND MARINE RESOURCE MANAGEMENT:  
APPENDICES G to J

September 1972

**PRICES SUBJECT TO CHANGE**

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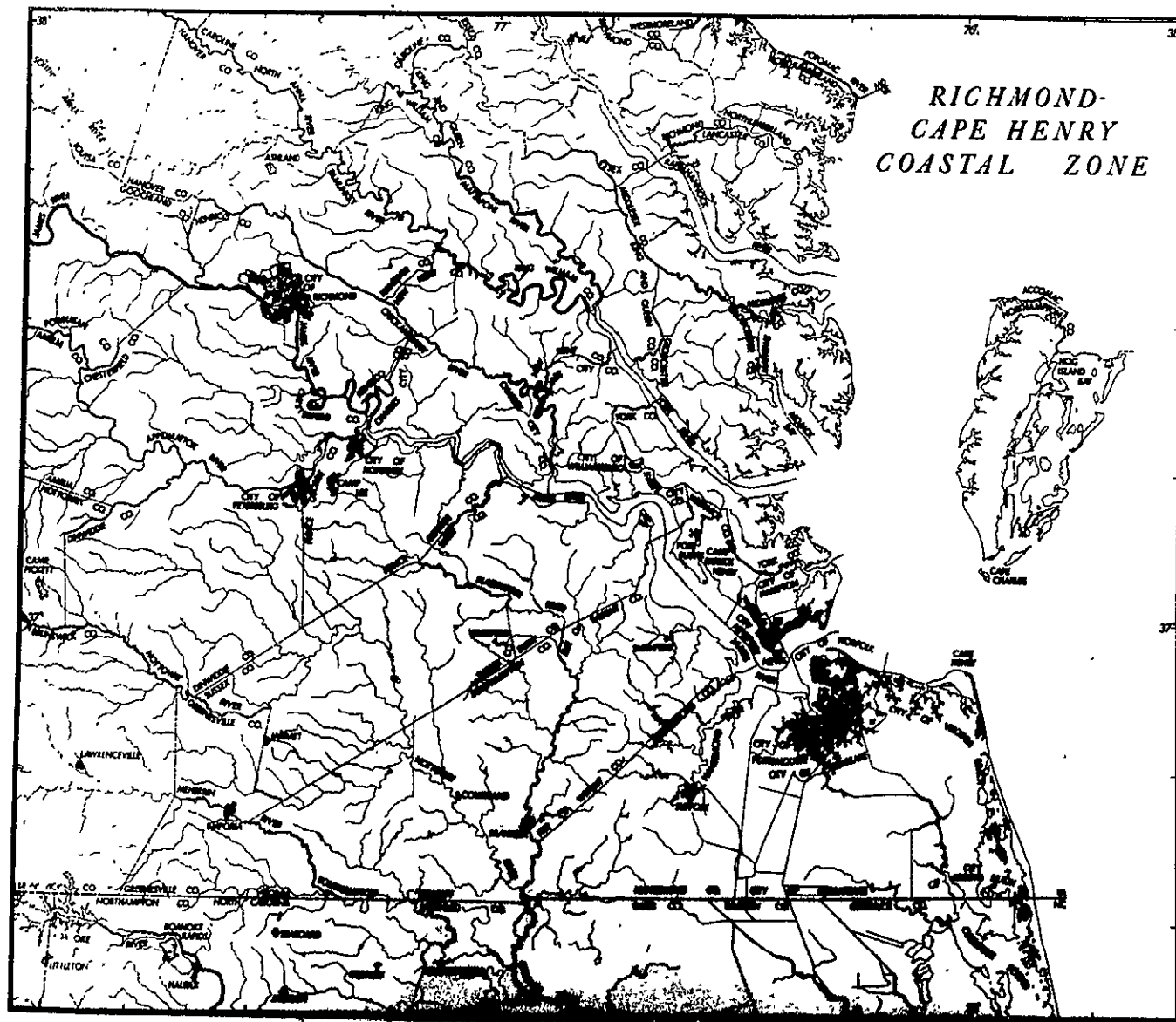
APPENDIX G  
POPULATION CHARACTERISTICS

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## APPENDIX G

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RICHEL Polictical Divisions

POPULATION PROJECTIONS TO 1980, 1990, 2000, 2010, AND 2020, FOR VIRGINIA COUNTIES, CITIES, AND PLANNING DISTRICTS<sup>a/</sup>

	Actual (Census)		Projections					Average Annual Rates of Change					
	1960	1970	1980 <sup>b/</sup>	1990	2000	2010	2020	1960-70	1970-80	1980-90	1990-2000	2000-2010	2010-2020
Planning District Fifteen	461,993	547,542	649,100	764,000	883,000	1,010,000	1,150,000	+1.7	+1.7	+1.6	+1.4	+1.3	+1.3
Richmond Regional PDC													
Charles City County	5,492	6,158	7,100	8,300	9,800	11,600	13,800	+1.2	+1.4	+1.5	+1.6	+1.7	+1.8
Chesterfield County	43,855 <sup>e/</sup>	76,855	100,000	135,000	178,000	227,800	283,700	+5.8	+2.7	+3.0	+2.8	+2.5	+2.2
Goochland County	9,206	10,069	15,000	22,000	31,300	42,800	56,500	+0.9	+4.1	+3.9	+3.6	+3.2	+2.8
Hanover County	27,550	37,479	52,500	70,000	88,800	108,200	130,000	+3.1	+3.4	+2.9	+2.4	+2.0	+2.0
Henrico County	117,339	154,364	193,000	230,000	264,400	298,000	330,000	+2.8	+2.1	+1.7	+1.4	+1.2	+1.0
New Kent County	4,504	5,300	6,500	8,500	11,200	14,900	20,000	+1.6	+2.1	+2.7	+2.8	+2.9	+3.0
Powhatan County	6,747	7,696	10,000	14,000	19,500	26,700	36,000	+1.3	+2.7	+3.4	+3.4	+3.2	+3.0
Richmond City	247,300 <sup>e/</sup>	249,621	265,000	276,000	280,000	280,000	280,000	+0.1	+0.6	+0.4	+0.1	*	*
Planning District Nineteen	141,471	161,059	177,800	198,500	220,000	245,000	272,000	+1.3	+1.0	+1.0	+1.0	+1.0	+1.0
Crater PDC													
Dinwiddie County <sup>f/</sup>	22,183	25,046	23,100	26,000	29,000	32,800	37,000	+1.2	-0.7	+1.1	+1.1	+1.2	+1.2
Greensville County	10,620 <sup>e/</sup>	9,604	9,000	8,500	8,100	8,000	8,000	-0.9	-0.9	-0.5	-0.4	-0.3	*
Prince George County <sup>f/</sup>	20,270	29,092	28,000	36,000	46,000	58,500	72,600	+3.7	-0.4	+2.5	+2.5	+2.4	+2.2
Surry County	6,220	5,882	5,600	5,500	5,400	5,400	5,400	-0.5	-0.5	-0.1	-0.1	*	*
Sussex County	12,411	11,464	11,200	11,000	11,000	11,000	11,200	-0.7	-0.2	-0.1	*	*	+0.1
Colonial Heights City	9,587 <sup>e/</sup>	15,097	20,000	24,000	28,200	32,800	37,600	+4.7	+2.9	+1.8	+1.6	+1.5	+1.4
Emporia City	5,535 <sup>e/</sup>	5,300	5,100	5,000	4,900	4,800	4,800	-0.4	-0.4	-0.2	-0.2	-0.2	*
Hopewell City	17,895	23,471	25,800	27,500	28,900	30,200	31,400	+2.8	+1.0	+0.6	+0.5	+0.4	+0.4
Petersburg City <sup>f/</sup>	36,750	36,103	50,000	55,000	58,500	61,500	64,000	-0.2	+3.3	+0.9	+0.6	+0.5	+0.4
Planning District Twenty	666,841	769,371	871,200	983,000	1,103,000	1,235,000	1,384,000	+1.4	+1.3	+1.2	+1.1	+1.1	+1.1
Southeastern Virginia PDC													
Isle of Wight County	17,164	18,285	20,000	23,000	26,700	31,200	36,600	+0.6	+1.0	+1.4	+1.5	+1.6	+1.6
Nansemond County	31,366	35,166	40,000	46,000	53,400	62,000	72,000	+1.2	+1.3	+1.4	+1.5	+1.5	+1.5
Southampton County <sup>e/</sup>	19,931	18,582	18,000	17,500	17,000	16,800	16,800	-0.7	-0.3	-0.2	-0.2	*	*
Chesapeake City <sup>e/</sup>	73,647	89,580	110,000	132,000	155,000	178,000	200,600	+2.0	+2.1	+1.8	+1.6	+1.4	+1.2
Franklin City <sup>e/</sup>	7,264	6,880	6,700	6,500	6,400	6,400	6,400	-0.5	-0.3	-0.3	-0.1	*	*
Norfolk City	304,869	307,951	311,000	312,000	311,000	310,000	310,000	+0.1	+0.1	*	*	*	*
Portsmouth City	114,773	110,963	109,000	107,500	106,500	106,000	105,000	-0.3	-0.2	-0.1	*	*	*
Suffolk City	12,609	9,858	9,000	8,500	8,200	8,000	8,000	-2.0	-0.9	-0.5	-0.3	-0.2	*
Virginia Beach City <sup>e/</sup>	85,218	172,106	247,500	330,000	418,800	516,600	628,600	+7.3	+3.7	+2.9	+2.4	+2.2	+2.0

Source: Population Projections to 1980, 1990, 2000, & 2020, for Virginia Counties, Cities, & Planning Districts, Statistical Inf. Series, No. 71-1, issued March '71, Commonwealth of Virginia, Division of State Planning and Community Affairs.

POPULATIONS PROJECTIONS TO 1980, 1990, 2000, 2010, AND 2020, FOR VIRGINIA COUNTIES, CITIES, AND PLANNING DISTRICTS<sup>a/</sup> (Cont.)

	Actual (Census)		Projections					Average Annual Rates of Change					
	1960	1970	1980 <sup>b/</sup>	1990	2000	2010	2020	1960-80	1970-80	1980-90	1990-2000	2000-2010	2010-2020
Planning District Twenty-one Peninsula PDC	242,874	319,081	400,000	480,000	562,000	647,000	740,000	+2.8	+2.3	+1.8	+1.5	+1.4	+1.3
James City County <sup>c/</sup>	10,449	17,853	24,000	32,000	42,200	54,000	67,000	+5.5	+3.0	+2.9	+2.8	+2.5	+2.2
York County <sup>c/</sup>	21,143	33,203	50,000	72,000	98,600	132,500	178,000	+4.4	+4.2	+3.7	+3.4	+3.0	+3.0
Hampton City	89,258	120,779	150,000	175,000	197,200	217,900	236,000	+3.1	+2.2	+1.5	+1.2	+1.0	+0.8
Newport News City <sup>c/</sup>	113,662	138,177	166,000	190,000	212,000	229,600	245,000	+2.0	+1.9	+1.3	+1.1	+0.8	+0.6
Williamsburg City <sup>c/</sup>	8,362	9,069	10,000	11,000	12,000	13,000	14,000	+0.8	+1.0	+0.9	+0.9	+0.8	+0.8

Note: Due to rounding there are slight differences between growth rates of the localities and the growth rates of the planning district totals; \* = less than 0.1 percent but greater than -0.1 percent.

<sup>a/</sup> It is assumed that the present city and county boundaries will remain the same.

<sup>b/</sup> The 1980 population projections are provisional and subject to change as economic base studies are completed or revised.

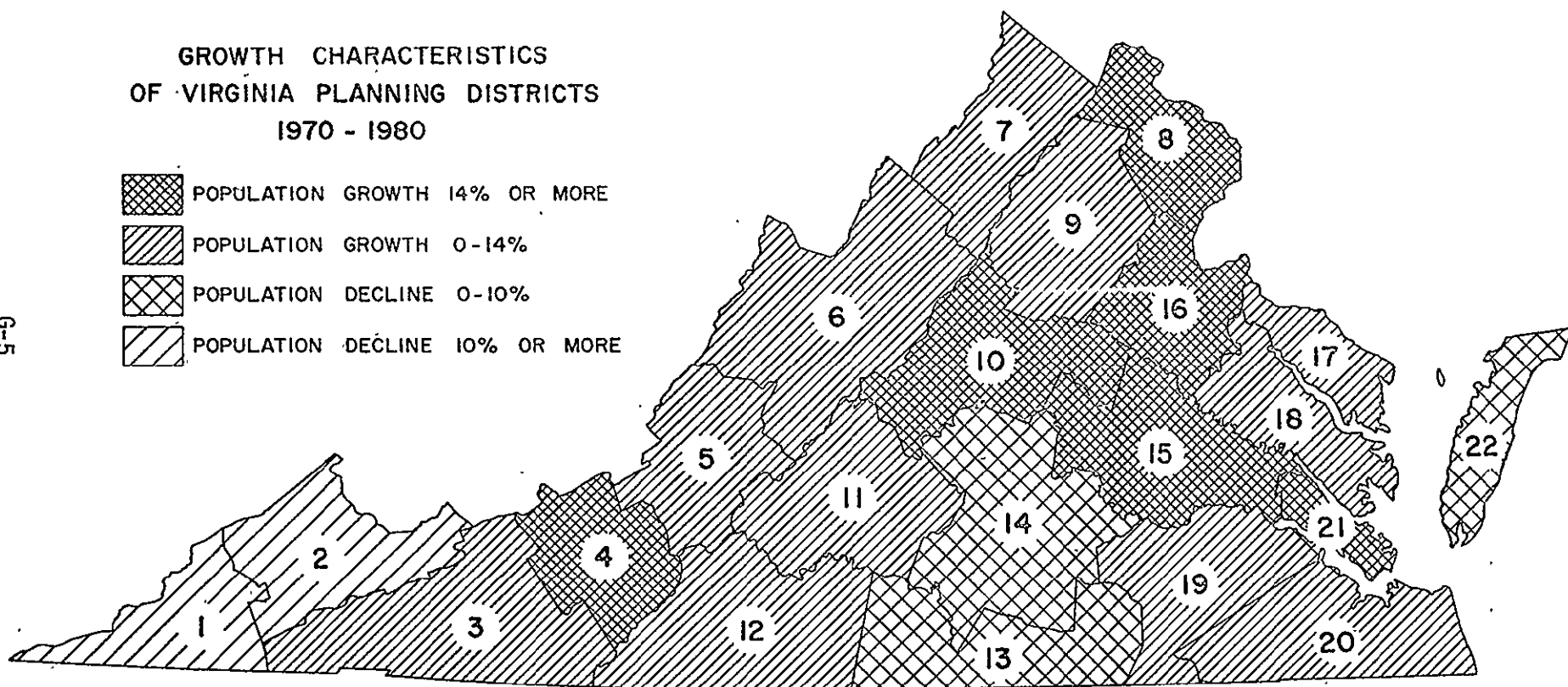
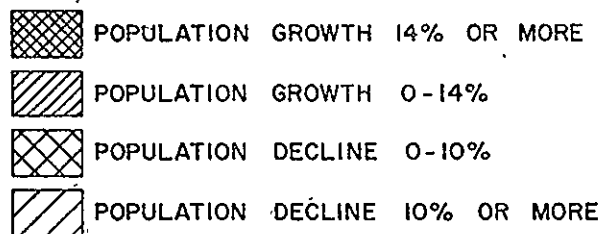
<sup>c/</sup> The 1960 population figures have been adjusted in order to reflect annexations and the creation of independent cities during the 1960 to 1970 period.

<sup>d/</sup> Not Applicable.

<sup>e/</sup> Adjustments have been made in the Richmond City and Chesterfield County population figures for both 1960 and 1970 to allow for the January 1, 1970 annexation of 47,262 Chesterfield County residents by the City of Richmond.

<sup>f/</sup> Adjustments have been made in the Dinwiddie County, Prince George County and Petersburg City population projections. To become effective, if upheld on a possible appeal, the city will gain 14.12 square miles of territory from the two counties. The Petersburg City population will be increased by approximately 9,000 persons, 5,500 of which will come from Prince George County and 3,500 from Dinwiddie County. The 1960 and 1970 Prince George County, Dinwiddie County and Petersburg City figures have not been altered.

GROWTH CHARACTERISTICS  
OF VIRGINIA PLANNING DISTRICTS  
1970 - 1980





ESTIMATED POPULATION OF THE COUNTIES & CITIES  
OF RICHEL, JULY 1, 1971

9-9

	<u>Population</u>			<u>Percent Change</u>	
	<u>July 1, 1971 (Provisional)</u>	<u>April 1, 1970</u>	<u>April 1, 1960</u>	<u>April 1970 to July 1971</u>	<u>April 1960 to April 1970</u>
Planning District Fifteen	556,543	547,542	461,993		
Richmond Regional PDC					
Charles City County	6,174	6,158	5,492	0.3	12.1
Chesterfield County	81,800	77,046	43,855a	6.2	75.1
Goochland County	10,135	10,069	9,206	0.7	9.4
Hanover County	38,651	37,479	27,550	3.1	36.0
Henrico County	158,699	154,364	117,339	2.8	31.6
New Kent County	5,376	5,300	4,504	1.4	14.1
Powhatan County	7,798	7,696	6,747	1.3	14.1
Richmond City	247,910	249,430	247,300a	-0.6	0.9
Planning District Nineteen	161,054	161,059	141,471		
Crater PDC					
Dinwiddie County	25,312	25,046	22,183	1.1	12.9
Greensville County	9,418	9,604	10,620	-1.9	- 9.6
Prince George County	28,922	29,092	18,770a	-0.6	55.0
Surry County	5,816	5,882	6,220	-1.1	- 5.4
Sussex County	11,289	11,464	12,411	-1.5	- 7.6
Colonial Heights City	15,841	15,097	9,587	4.9	57.5
Emporia City	5,234	5,300	5,535	-1.2	- 4.2
Hopewell City	23,753	23,471	19,395a	1.2	21.0
Petersburg City	35,469	36,103	36,750	-1.8	- 1.8

ESTIMATED POPULATION OF THE COUNTIES & CITIES  
OF RICHEL, JULY 1, 1971 (CONT'D)

	<u>Population</u>			<u>Percent Change</u>	
	<u>July 1, 1971 (Provisional)</u>	<u>April 1, 1970</u>	<u>April 1, 1960</u>	<u>April 1970 to July 1971</u>	<u>April 1960 to April 1970</u>
Planning District Twenty	770,760	769,371	666,841		
Southeastern Virginia PDC					
Isle of Wight County	18,323	18,285	17,164	0.2	6.5
Nansemond County	35,444	35,166	31,366	0.8	12.1
Southampton County	18,220	18,582	19,931	-1.9	- 6.8
Chesapeake City	91,187	89,580	66,447 <sup>a</sup>	1.8	34.8
Franklin City	6,759	6,880	7,264	-1.8	- 5.3
Norfolk City	296,823	307,951	304,869	-3.6	1.0
Portsmouth City	109,928	110,963	121,973 <sup>a</sup>	-0.9	- 9.0
Suffolk City	9,497	9,858	12,609	-3.7	-21.8
Virginia Beach City	184,579	172,106	85,218	7.2	102.0
Planning District Twenty-one	324,984	319,081	242,874		
Peninsula PDC					
James City County	19,004	17,853	10,449 <sup>a</sup>	6.4	70.9
York County	34,630	33,203	21,143 <sup>a</sup>	4.3	57.0
Hampton City	123,485	120,779	89,258	2.2	35.3
Newport News City	138,872	138,177	113,662	.0.5	21.6
Williamsburg City	8,993	9,069	8,362 <sup>a</sup>	-0.8	8.5
TOTAL	1,813,341	1,797,053	1,513,179		

<sup>a</sup>/1960 population is adjusted to new boundaries to reflect annexations occurring between 1960 and 1970.

Source: Estimates of the Population of Virginia Counties and Cities: July 1, 1971 (Provisional),  
A report from The Bureau of Population and Economic Research, University of Virginia  
Graduate School of Business Administration, Charlottesville, Virginia

## POPULATION AND HOUSING DATA

### Column

- 1                    Count of all persons
- 2                    Count of all housing units

NOTE: Counts in Columns 3 to 13 are introduced for Census processing and are useful only above the ED level.

- 3                    Count of persons in rural areas (sum of 8 and 9 plus persons in other rural territory)
- 4                    Count of persons in annexed territories
- 5                    Count of rural housing units
- 6                    Count of persons in SMSA's

Source: 1970 Census Tapes, University of Virginia

COUNTIES, TOWNS & CITIES BY CENSUS NUMBERS

<u>Locality</u>	<u>Computer Printout Identification No.</u>	<u>Census Tract (CT) &amp; Enumeration Dist. (ED) Where Applicable</u>
Charles City	36	
Chesterfield	41	
Dinwiddie	53	
McKenny	53	ED-16
Goochland	75	
Greensville	81	
Jarratt	81	ED-1
Hanover	85	
Ashland	85	CT-3004, ED-6,7
Henrico	87	
Isle of Wight	93	
Smithfield	93	ED-1,2
Windsor	93	ED-7
James City	95	
Nansemond	123	
Hollond	123	CT-709, ED-15
Whaleyville	123	CT-709, ED-24
New Kent	127	
Powhatan	145	
Prince George	149	
Southampton	175	
Boykins	175	ED-13
Capron	175	ED-8
Courtland	175	ED-4
Ivory	175	ED-1
Newsoms	175	ED-17
Branchville	175	ED-14
Surry C	181	
Claremont	181	ED-4
Dendron	181	ED-7
Surry	181	ED-1
Sussex	183	
Jarratt	183	ED-13
Stony Creek	183	ED-10
Waverly	183	ED-1,2
Wakefield	183	ED-5
York	199	
Poquoson	199	CT-501, ED-321,322,323
<u>CITIES</u>		
Franklin	620	
Hampton	650	
Hopewell	670	
Newport News	700	
Norfolk	710	
Petersburg	730	
Portsmouth	740	
Richmond	760	
Suffolk	800	
Virginia Beach	810	
Williamsburg	830	

# POPULATION AND HOUSING DATA

COUNTY		NUM PERS	HS UNITS	RURAL POP	ANXD POP	RURAL HSG	MSA POP
36	INCORPORATED	0	0	0	0	0	0
36	UNINCORPORATED	6158	1578	6158	0	1578	0
36	TOTAL	6158	1578	6158	0	1578	0
41	INCORPORATED	0	0	0	0	0	0
41	UNINCORPORATED	76855	22498	35049	0	9656	76855
41	TOTAL	76855	22498	35049	0	9656	76855
53	INCORPORATED	489	178	489	0	178	489
53	UNINCORPORATED	24557	6020	15041	0	4279	24557
53	TOTAL	25046	6198	15530	0	4457	25046
75	INCORPORATED	0	0	0	0	0	0
75	UNINCORPORATED	10069	2876	10069	0	2876	0
75	TOTAL	10069	2876	10069	0	2876	0
81	INCORPORATED	407	147	407	0	147	0
81	UNINCORPORATED	9197	2667	9197	0	2667	0
81	TOTAL	9604	2814	9604	0	2814	0
85	INCORPORATED	2934	786	0	0	0	2934
85	UNINCORPORATED	34545	10161	29185	0	8509	34545
85	TOTAL	37479	10947	29185	0	8509	37479
87	INCORPORATED	0	0	0	0	0	0
87	UNINCORPORATED	154364	49527	25037	0	7419	154364
87	TOTAL	154364	49527	25037	0	7419	154364
93	INCORPORATED	3398	1102	685	0	249	0
93	UNINCORPORATED	14887	4330	14887	0	4330	0
93	TOTAL	18285	5432	15572	0	4579	0
95	INCORPORATED	0	0	0	0	0	0
95	UNINCORPORATED	17853	5030	16453	0	4568	0
95	TOTAL	17853	5030	16453	0	4568	0
123	INCORPORATED	732	247	732	0	247	0
123	UNINCORPORATED	34434	10028	34434	0	10028	0
123	TOTAL	35166	10275	35166	0	10275	0
127	INCORPORATED	0	0	0	0	0	0
127	UNINCORPORATED	5300	1632	5300	0	1632	0
127	TOTAL	5300	1632	5300	0	1632	0

# POPULATION AND HOUSING DATA -

COUNTY		NUM PERS	HS UNITS	RURAL POP.	ANXD POP	RURAL HSG	SMSA POP
145	INCORPORATED	0	0	0	0	0	0
145	UNINCORPORATED	7696	1971	7696	0	1971	0
145	TOTAL	7696	1971	7696	0	1971	0
149	INCORPORATED	12435	1126	0	0	0	12435
149	UNINCORPORATED	16657	4776	16657	0	4776	16657
149	TOTAL	29092	5902	16657	0	4776	29092
175	INCORPORATED	2977	1064	2977	0	1064	0
175	UNINCORPORATED	15605	4378	15605	0	4378	0
175	TOTAL	18582	5442	18582	0	5442	0
181	INCORPORATED	988	434	988	0	434	0
181	UNINCORPORATED	4894	1607	4894	0	1607	0
181	TOTAL	5882	2041	5882	0	2041	0
183	INCORPORATED	3273	1075	3273	0	1075	0
183	UNINCORPORATED	8191	2188	8191	0	2188	0
183	TOTAL	11464	3263	11464	0	3263	0
199	INCORPORATED	5441	1739	0	0	0	5441
199	UNINCORPORATED	27762	7518	25296	0	6977	27762
199	TOTAL	33203	9257	25296	0	6977	33203
550	INCORPORATED	89580	25865	6964	0	1794	89580
550	UNINCORPORATED	0	0	0	0	0	0
550	TOTAL	89580	25865	6964	0	1794	89580
570	INCORPORATED	15097	4892	0	0	0	15097
570	UNINCORPORATED	0	0	0	0	0	0
570	TOTAL	15097	4892	0	0	0	15097
595	INCORPORATED	5300	1814	0	0	0	0
595	UNINCORPORATED	0	0	0	0	0	0
595	TOTAL	5300	1814	0	0	0	0
620	INCORPORATED	6880	2206	0	0	0	0
620	UNINCORPORATED	0	0	0	0	0	0
620	TOTAL	6880	2206	0	0	0	0
650	INCORPORATED	120779	36556	0	38	0	120779
650	UNINCORPORATED	0	0	0	0	0	0
650	TOTAL	120779	36556	0	38	0	120779

# POPULATION AND HOUSING DATA

COUNTY		NUM PERS	HS UNITS	RURAL POP.	ANXD POP.	RURAL HSG	SMSA POP
670	INCORPORATED	23471	7642	0	0	0	23471
670	UNINCORPORATED	0	0	0	0	0	0
670	TOTAL	23471	7642	0	0	0	23471
700	INCORPORATED	138177	41696	0	0	0	138177
700	UNINCORPORATED	0	0	0	0	0	0
700	TOTAL	138177	41696	0	0	0	138177
710	INCORPORATED	307951	91065	0	0	0	307951
710	UNINCORPORATED	0	0	0	0	0	0
710	TOTAL	307951	91065	0	0	0	307951
730	INCORPORATED	36103	11966	0	0	0	36103
730	UNINCORPORATED	0	0	0	0	0	0
730	TOTAL	36103	11966	0	0	0	36103
740	INCORPORATED	110963	36475	0	545	0	110963
740	UNINCORPORATED	0	0	0	0	0	0
740	TOTAL	110963	36475	0	545	0	110963
760	INCORPORATED	249621	87083	0	47262	0	249621
760	UNINCORPORATED	0	0	0	0	0	0
760	TOTAL	249621	87083	0	47262	0	249621
800	INCORPORATED	9858	3609	0	0	0	0
800	UNINCORPORATED	0	0	0	0	0	0
800	TOTAL	9858	3609	0	0	0	0
810	INCORPORATED	172106	47960	5377	0	1868	172106
810	UNINCORPORATED	0	0	0	0	0	0
810	TOTAL	172106	47960	5377	0	1868	172106
830	INCORPORATED	9069	2613	0	2115	0	0
830	UNINCORPORATED	0	0	0	0	0	0
830	TOTAL	9069	2613	0	2115	0	0

## POPULATION AND HOUSING DATA

### Column

7	Count of persons in urban portion of central cities of SMSA's
8	Count of persons in rural places of 1,000 to 2,499
9	Count of persons in rural places of less than 1,000
10	Count of persons in urban portion of central cities of urbanized areas
11	Count of persons in urbanized areas in urban portion of places of 25,000 <sup>+</sup> outside central cities
12	Count of persons in urbanized areas in urban portion of places of 2,500 to 24,999 outside central cities
13	Count of persons in urbanized areas (sum of 10, 11, and 12, plus persons outside central cities who are in places of less than 2,500 and persons in other urban territory)

+Value of one-family owner-occupied (or vacant-for-sale) houses on less than 10 acres and without commercial establishment on property (excludes cooperatives or condominiums and mobile homes or trailers).

Source: 1970 Census Tapes, University of Virginia



# POPULATION AND HOUSING DATA

COUNTY	URBAN CC POP.(SMSA)	RURAL POP 1000-2499	RURAL POP <1000	URBAN CC URBAN AREA	URBAN >25000	URBAN 2500 TO 24999	TOTAL URBAN
36 INCORPORATED	0	0	0	0	0	0	0
36 UNINCORPORATED	0	0	0	0	0	0	0
36 TOTAL	0	0	0	0	0	0	0
41 INCORPORATED	0	0	0	0	0	0	0
41 UNINCORPORATED	0	829	0	0	0	10562	36250
41 TOTAL	0	829	0	0	0	10562	36250
53 INCORPORATED	0	0	489	0	0	0	0
53 UNINCORPORATED	0	0	0	0	0	0	9516
53 TOTAL	0	0	489	0	0	0	9516
75 INCORPORATED	0	0	0	0	0	0	0
75 UNINCORPORATED	0	0	0	0	0	0	0
75 TOTAL	0	0	0	0	0	0	0
81 INCORPORATED	0	0	407	0	0	0	0
81 UNINCORPORATED	0	0	0	0	0	0	0
81 TOTAL	0	0	407	0	0	0	0
85 INCORPORATED	0	0	0	0	0	0	0
85 UNINCORPORATED	0	0	0	0	0	5189	5360
85 TOTAL	0	0	0	0	0	5189	5360
87 INCORPORATED	0	0	0	0	0	0	0
87 UNINCORPORATED	0	0	0	0	0	18482	129327
87 TOTAL	0	0	0	0	0	18482	129327
93 INCORPORATED	0	0	685	0	0	0	0
93 UNINCORPORATED	0	0	0	0	0	0	0
93 TOTAL	0	0	685	0	0	0	0
95 INCORPORATED	0	0	0	0	0	0	0
95 UNINCORPORATED	0	0	0	0	0	0	1400
95 TOTAL	0	0	0	0	0	0	1400
123 INCORPORATED	0	0	732	0	0	0	0
123 UNINCORPORATED	0	8327	0	0	0	0	0
123 TOTAL	0	8327	732	0	0	0	0
127 INCORPORATED	0	0	0	0	0	0	0
127 UNINCORPORATED	0	0	0	0	0	0	0
127 TOTAL	0	0	0	0	0	0	0

# POPULATION AND HOUSING DATA

COUNTY	URBAN CC POP(SMSA)	RURAL POP 1000-2499	RURAL POP <1000	URBAN CC URBAN AREA	URBAN >25000	URBAN 2500 TO 24999	TOTAL URBAN
145 INCORPORATED	0	0	0	0	0	0	0
145 UNINCORPORATED	0	0	0	0	0	0	0
145 TOTAL	0	0	0	0	0	0	0
149 INCORPORATED	0	0	0	0	0	12435	12435
149 UNINCORPORATED	0	0	0	0	0	0	0
149 TOTAL	0	0	0	0	0	12435	12435
175 INCORPORATED	0	0	2977	0	0	0	0
175 UNINCORPORATED	0	0	0	0	0	0	0
175 TOTAL	0	0	2977	0	0	0	0
181 INCORPORATED	0	0	988	0	0	0	0
181 UNINCORPORATED	0	0	0	0	0	0	0
181 TOTAL	0	0	988	0	0	0	0
183 INCORPORATED	0	1717	1556	0	0	0	0
183 UNINCORPORATED	0	0	0	0	0	0	0
183 TOTAL	0	1717	1556	0	0	0	0
199 INCORPORATED	0	0	0	0	0	5441	5441
199 UNINCORPORATED	0	0	0	0	0	0	2466
199 TOTAL	0	0	0	0	0	5441	7907
550 INCORPORATED	0	0	0	0	82616	0	82616
550 UNINCORPORATED	0	0	0	0	0	0	0
550 TOTAL	0	0	0	0	82616	0	82616
570 INCORPORATED	15097	0	0	15097	0	0	15097
570 UNINCORPORATED	0	0	0	0	0	0	0
570 TOTAL	15097	0	0	15097	0	0	15097
595 INCORPORATED	0	0	0	0	0	0	0
595 UNINCORPORATED	0	0	0	0	0	0	0
595 TOTAL	0	0	0	0	0	0	0
620 INCORPORATED	0	0	0	0	0	0	0
620 UNINCORPORATED	0	0	0	0	0	0	0
620 TOTAL	0	0	0	0	0	0	0
650 INCORPORATED	120779	0	0	120779	0	0	120779
650 UNINCORPORATED	0	0	0	0	0	0	0
650 TOTAL	120779	0	0	120779	0	0	120779

# POPULATION AND HOUSING DATA

COUNTY.	URBAN CC POP(SMSA)	RURAL POP 1000-2499	RURAL POP <1000	URBAN CC URBAN AREA	URBAN >25000	URBAN 2500 TO 24999	TOTAL URBAN
670 INCORPORATED	0	0	0	0	0	23471	23471
670 UNINCORPORATED	0	0	0	0	0	0	0
670 TOTAL	0	0	0	0	0	23471	23471
700 INCORPORATED	138177	0	0	138177	0	0	138177
700 UNINCORPORATED	0	0	0	0	0	0	0
700 TOTAL	138177	0	0	138177	0	0	138177
710 INCORPORATED	307951	0	0	307951	0	0	307951
710 UNINCORPORATED	0	0	0	0	0	0	0
710 TOTAL	307951	0	0	307951	0	0	307951
730 INCORPORATED	36103	0	0	36103	0	0	36103
730 UNINCORPORATED	0	0	0	0	0	0	0
730 TOTAL	36103	0	0	36103	0	0	36103
740 INCORPORATED	110963	0	0	110963	0	0	110963
740 UNINCORPORATED	0	0	0	0	0	0	0
740 TOTAL	110963	0	0	110963	0	0	110963
760 INCORPORATED	249621	0	0	249621	0	0	249621
760 UNINCORPORATED	0	0	0	0	0	0	0
760 TOTAL	249621	0	0	249621	0	0	249621
800 INCORPORATED	0	0	0	0	0	0	0
800 UNINCORPORATED	0	0	0	0	0	0	0
800 TOTAL	0	0	0	0	0	0	0
810 INCORPORATED	0	0	0	0	166729	0	166729
810 UNINCORPORATED	0	0	0	0	0	0	0
810 TOTAL	0	0	0	0	166729	0	166729
830 INCORPORATED	0	0	0	0	0	0	0
830 UNINCORPORATED	0	0	0	0	0	0	0
830 TOTAL	0	0	0	0	0	0	0

## APPENDIX H

### EROSION

*H-i*

## APPENDIX H

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# VALUES OF C FOR USE IN RATIONAL FORMULA

Lawns:	
Sandy soil, flat, 2% . . .	0.05-0.10
Sandy soil, average, 2-7% . . .	0.10-0.15
Sandy soil, steep, 7% . . .	0.15-0.20
Heavy soil, flat, 2% . . . . .	0.11-0.17
Heavy soil, average, 2-7% . . . . .	0.18-0.22
Heavy soil, steep, 7% . . . . .	0.25-0.35
Business:	
Downtown areas . . . . .	0.70-0.95
Neighborhood areas . . . . .	0.50-0.70
Residential:	
Single-family areas . . . . .	0.30-0.50
Multi units, detached . . . . .	0.40-0.60
Multi units, attached . . . . .	0.60-0.75
Suburban . . . . .	0.25-0.40
Apartment dwelling areas . . . . .	0.50-0.70
Industrial:	
Light areas . . . . .	0.50-0.80
Heavy areas . . . . .	0.60-0.90
Parks, cemeteries . . . . .	0.10-0.25
Playgrounds . . . . .	0.20-0.35
Railroad yard areas . . . . .	0.20-0.40
Unimproved areas . . . . .	0.10-0.30
Streets:	
Asphaltic . . . . .	0.70-0.95
Concrete . . . . .	0.80-0.95
Brick . . . . .	0.70-0.85
Drives and walks . . . . .	0.75-0.85
Roofs . . . . .	0.75-0.95

Soil type	Watershed cover		
	Cultivated	Pasture	Woodlands
With above-average infiltration rates; usually sandy or gravelly . . . . .	0.20	0.15	0.10
With average infiltration rates; no clay pans, loams and similar soils . . . . .	0.40	0.35	0.30
With below-average infiltration rates; heavy clay soils or soils with a clay pan near the surface; shallow soils above impervious rock . . . . .	0.50	0.45	0.40

Source: Chow (1966)

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## SOIL LOSS FORMULA

### INTRODUCTION\*

#### Estimating Soil Loss

The development of a Universal Equation for Predicting Rainfall Erosion Losses has been developed by the Runoff and Soil Loss Data Summary Laboratory, VSDA, Lafayette, Indiana from data gathered from 37 research projects in 21 states. It represents about 8,000 plot years of basic runoff and associated precipitation.

Statistical analysis shows that six major factors are responsible for the average annual soil loss on cropland. These factors are expressed by the formula:

$$A = K R L S C P$$

where, A is the average annual predicted soil loss in tons per acre per year

K is the soil erodibility factor

R is the rainfall factor

L is the length of slope factor

S is the percent of slope factor

C is the cropping management factor

P is the erosion control practice factor

#### Explanation of Factors in Formula and Values

The average annual soil loss "A" in tons per acre is obtained when appropriate numerical values are applied in the formula for the six factors K R L S C & P.

Source: \*Agricultural Handbook #282, Soil Loss Prediction for Virginia, U.S. Department of Agriculture, Soil Conservation Service, Richmond, Virginia.

Soil Erodibility Factor "K" - Evidence shows that various soils erode at different rates under the same environmental conditions. The erodibility factor (K) is a numerical expression of the relative erodibility. [It is defined as the soil loss in tons per acre per unit of rainfall index (E 1, Erosion Index) on a 9 percent slope 72.6 feet long under tilled continuous fallow.]

Physical characteristics and related qualities of a soil determine its erodibility factor and soil loss tolerance (T). Soil loss tolerance factor "T" is the maximum permissible estimated average annual soil loss "A" for a given soil. Soil loss tolerances range from 1 to 5 tons per acre. When soil loss exceeds 5 tons, there is likely to be excessive off-site damages through deposition, etc. The "K" (soil erodibility) and "T" (soil loss tolerance) values for soils in RICHEL are given in Table 1.

The Rainfall Erosion Factor "R" value for a locality is the rainfall erosion index (E 1). This index expresses the capacity of rainfall to CAUSE erosion from cultivated fallow soil. Kinetic energy and intensity of rainstorms have been considered in determining the rainfall erosion index. In Virginia, the values of "R" generally are lowest in the mountains and highest along the coast. The values assigned to each county are given in Table 2.

The Length of Slope Factor "L" is the ratio of soil loss from any given slope length compared with the soil loss from the specific length (plot length) on which "K" was determined. Slope length on a field is measured



from the point of origin of overland flow either to the point where runoff is slowed to the extent that soil deposition begins, or where the water enters a well defined channel such as a terrace. (See Figure 1).

The Percent of Slope Factor "S" is the ratio of soil loss from any given slope percent compared with the soil loss from that percent where the "K" value was determined (plat slope). The inter-relationship between length and percent of slope is best shown in graphic form. The values of "L" and "S" have been combined into one value "LS" and are obtained from Figure 1.

The Cropping-Management Factor "C" combines the effect of crops, crop sequence, crop cover, and the many other aspects of management. "C" is the percent or ratio of soil loss from land cropped under specified conditions compared to soil loss from continuous cultivated fallow on identical soil, slope and rainfall conditions. The "C" values for specific cropping-management practices are given in Table 4.

The Erosion Control Practice Factor "P" is the ratio of soil loss with a specified practice to that of up and downhill cultivation when other conditions are the same. Values for contouring and contour stripcropping have been established (Table 3).

The "P" values for terracing is the same as contouring. The length of slope is the distance between terraces.

All soil loss predictions using this equation are based on the assumption that natural waterways are stabilized, either with or without vegetation.

TABLE 1  
"K" & "T" Factors  
Soil Loss Prediction Study  
Virginia

Coastal Plain

	1 and 2 Erosion			3 Erosion		
	K	T	T/K	K	T	T/K
Beltsville	.43	3	7.0	.43	2	4.7
Bradley	.37	4	10.8	.37	3	8.1
Bradley gravelly	.32	4	12.5	.32	3	9.4
Brays	.43	3	7.0	.43	2	4.7
Cahaba	.28	4	14.3	.28	3	10.7
Cahaba, thick surface	.20	4	20.0			
Caroline	.43	2	4.7	.43	1	2.3
Chesterfield	.37	4	10.8	.37	3	8.1
Chesterfield gravelly	.32	4	12.5	.32	3	9.4
Craven	.43	2	4.7	.43	1	2.3
Faceville	.32	3	9.4	.32	2	6.2
Fairfax	.43	3	7.0	.43	2	4.7
Fairfax gravelly	.37	3	8.1	.37	2	5.4
Galestown loamy fine sand	.20	4	20.0			
Galestown sand	.17	5	29.4			
Goldsboro	.28	4	14.3	.28	3	10.7
Hyattsville	.28	4	14.3			
Index 1/	.37	4	10.8	.37	3	8.1
Kalmia	.28	4	14.3	.28	3	10.7
Kalmia gravelly	.24	4	16.7	.24	3	12.5
Kalmia, thick surface	.20	4	20.0			
Kempsville	.28	4	14.3	.28	3	10.7
Kempsville, thick surface	.20	4	20.0			
Kempsville, heavy substratum	.28	4	14.3	.28	3	10.7
Keyport	.43	4	9.3	.43	3	7.0
Lakeland loamy fine sand, loamy sand	.20	4	20.0			
Lakeland sand	.17	4	23.5			
Lakeland, terrace phase	.20	4	20.0			
Lunt	.49	2	4.1	.49	1	2.0
Marlboro	.32	3	9.4	.32	2	6.2
Matapeake	.32	3	9.4	.32	2	6.2
Mattapex	.32	3	9.4	.32	2	6.2
Norfolk	.28	4	14.3	.28	3	10.7
Norfolk gravelly	.24	4	16.7	.24	3	12.5
Norfolk, thick surface	.20	4	20.0			
Orangeburg	.28	4	14.3	.28	3	10.7
Orangeburg, thick surface	.20	4	20.0			

1/ Uncorrelated field name.

TABLE 1  
 "K" & "T" Factors  
 Soil Loss Prediction Study  
 Virginia

Coastal Plain

	1 and 2 Erosion			3 Erosion		
	K	T	T/K	K	T	T/K
Rumford	.20	4	20.0	.20	3	15.0
Rumford, thick surface	.17	4	23.5			
Ruston	.28	4	14.3	.28	3	10.7
Sandy Land						
Loamy						
& Gravelly Sediments)						
Way- side	.20	4	20.0	.20	3	15.0
Sassafras	.28	4	14.3	.28	3	10.7
Sassafras gravelly	.24	4	16.7	.24	3	12.5
Sassafras, thick surface	.20	4	20.0			
Sassafras, heavy substratum	.28	4	14.3	.28	3	10.7
Stough	.28	4	14.3			
Woodstown	.28	4	14.3			

TABLE 1  
"K" & "T" Factors  
Soil Loss Prediction Study  
Virginia

Blue Ridge & Piedmont

	1 and 2 Erosion			3 Erosion		
	K	T	T/K	K	T	T/K
Airmont	.28	4	14.3	.28	3	10.7
Airmont stony	.24	4	16.7	.24	3	12.5
Airmont very stony	.20	3	15.0	.20	2	10.0
Alamance	.37	4	10.8	.37	3	8.1
Alamance gravelly	.32	3	9.4	.32	2	6.2
Albemarle	.37	4	10.8	.37	3	8.1
Aldino	.43	3	7.0	.43	2	4.7
Allen	.32	4	12.5	.32	3	9.4
Altavista	.37	4	10.8	.37	3	8.1
Altavista gravelly	.32	4	12.5	.32	3	9.4
Appling	.37	4	10.8	.37	3	8.1
Appling coarse gritty	.32	4	12.5	.32	3	9.4
Appling gravelly	.32	4	12.5	.32	3	9.4
Appling angular cobbly	.32	4	12.5	.32	3	9.4
Ashe	.24	2	8.3	.24	1	4.2
Ashe coarse gritty	.20	2	10.0	.20	1	5.0
Ashe stony	.20	2	10.0	.20	1	5.0
Ashe very stony	.17	2	11.7	.17	1	5.9
Athol	.28	4	14.3	.28	3	10.7
Athol gravelly	.24	4	16.7	.24	3	12.5
Balfour	.32	4	12.5	.32	3	9.4
Balfour stony	.28	4	14.3	.28	3	10.7
Belvoir	.43	3	7.0	.43	2	4.7
Birdsboro	.28	4	14.3	.28	3	10.7
Braddock	.37	4	10.8	.37	3	8.1
Braddock gravelly	.32	4	12.5	.32	3	9.4
Braddock cobbly	.32	4	12.5	.32	3	9.4
Braddock stony	.32	4	12.5	.32	3	9.4
Braddock very stony	.24	3	12.5	.24	2	8.3
Brandywine	.28	3	10.7	.28	2	7.1
Brandywine coarse gritty	.20	3	15.0	.20	2	10.0
Brandywine stony	.24	3	12.5	.24	2	8.3
Brecknock	.37	3	8.1	.37	2	5.4
Brecknock gravelly	.32	3	9.4	.32	2	6.2
Bremo	.32	2	6.2	.32	1	3.1
Bucks	.37	4	10.8	.37	3	8.1
Bucks cobbly	.32	4	12.5	.32	3	9.4
Buckingham	.28	3	10.7	.28	2	7.1
Buckingham very stony	.20	3	15.0	.20	2	10.0

TABLE 1  
"K" & "T" Factors  
Soil Loss Prediction Study  
Virginia

Blue Ridge & Piedmont

	1 and 2 Erosion			3 Erosion		
	K	T	T/K	K	T	T/K
Buncombe loamy fine sandy	.20	4	20.0			
Buncombe sand	.17	4	23.5			
Burton	.24	1	4.2			
Burton stony	.20	1	5.0			
Burton very stony	.17	1	5.9			
Calverton	.32	3	9.4	.32	2	6.2
Catlett	.28	2	7.1	.28	1	3.6
Catlett gravelly	.24	2	8.4	.24	1	4.2
Catlett shaly	.20	2	10.0	.20	1	5.0
Catlett very stony	.20	2	10.0	.20	1	5.0
Catoctin	.28	3	10.7	.28	2	7.1
Catoctin very stony	.20	2	10.0	.20	1	5.0
Cecil	.37	4	10.8	.37	3	8.1
Cecil coarse gritty	.32	4	12.5	.32	3	9.4
Cecil gravelly	.32	4	12.5	.32	3	9.4
Cecil cobbly	.32	4	12.5	.32	3	9.4
Chandler	.32	1	3.1	.32	1	3.1
Chester	.28	4	14.3	.28	3	10.7
Clifton	.37	4	10.8	.37	3	8.1
Clifton stony	.32	3	9.4	.32	2	6.2
Clifton shallow phase	.37	2	5.4	.37	1	2.7
Colfax	.37	4	10.8	.37	3	8.1
Colleen	.37	4	10.8	.37	3	8.1
Congaree	.32	4	12.5			
Creedmoor	.43	3	7.0	.43	2	4.7
Croton	.43	2	4.7	.43	1	2.3
Culpeper	.37	4	10.8	.37	3	8.1
Davidson	.37	4	10.8	.37	3	8.1
Davidson loam, shallow phase	.37	3	8.1	.37	2	5.4
Davidson stony	.32	4	12.5	.32	3	9.4
Davidson very stony	.24	3	12.5	.24	2	8.3
Durham	.32	4	12.5	.32	3	9.4
Durham coarse gritty	.28	4	14.3	.28	3	10.7
Durham gravelly	.28	4	14.3	.28	3	10.7
Dyke	.37	4	10.8	.37	3	8.1
Dyke cobbly	.37	4	10.8	.37	3	8.1
Dyke stony	.37	4	10.8	.37	3	8.1
Dyke very stony	.24	3	12.5	.24	2	8.3
Edneyville	.28	3	10.7	.28	2	7.1

TABLE 1  
"K" & "T" Factors  
Soil Loss Prediction Study  
Virginia

Blue Ridge & Piedmont

	1 and 2 Erosion			3 Erosion		
	K	T	T/K	K	T	T/K
Efland	.43	3	7.0	.43	2	4.7
Elbert	.49	2	4.1	.49	1	2.0
Elbert very stony	.43	2	4.7	.43	1	2.3
Elloak	.32	4	12.5	.32	3	9.4
Enon	.43	3	7.0	.43	2	4.7
Enon stony	.43	3	7.0	.43	2	4.7
Eubanks	.37	4	10.8	.37	3	8.1
Eubanks stony	.32	4	12.5	.32	3	9.4
Fannin	.43	3	7.0	.43	2	4.7
Fauquier	.32	3	9.4	.32	2	6.2
Fletcher	.37	4	10.8	.37	3	8.1
Fluvanna	.37	3	8.1	.37	2	5.4
Georgeville	.37	4	10.8	.37	3	8.1
Glennelg	.32	4	12.5	.32	3	9.4
Glenville	.37	3	8.1	.37	2	5.4
Goldston	.43	2	4.7	.43	1	2.3
Goldston slaty	.28	2	7.1	.28	1	3.6
Granville	.28	4	14.3	.28	3	10.7
Grover	.37	3	8.1	.37	2	5.4
Habersham	.32	4	12.5	.32	3	9.4
Halewood	.32	4	12.5	.32	3	9.4
Halewood stony	.28	4	14.3	.38	3	10.7
Hayesville	.37	4	10.8	.37	3	8.1
Hayesville cobbly	.32	4	12.5	.32	3	9.4
Hazel	.28	2	7.1	.28	1	3.6
Hazel channery	.24	2	8.3	.24	1	4.2
Hazel stony	.24	2	8.3	.24	1	4.2
Helena	.43	3	7.0	.43	2	4.7
Herndon	.37	4	10.8	.37	3	8.1
Herndon gravelly	.32	4	12.5	.32	3	9.4
Hiwassee	.37	4	10.8	.37	3	8.1
Hiwassee cobbly	.32	4	12.5	.32	3	9.4
Hiwassee light col. variant	.37	4	10.8	.37	3	8.1
Hiwassee cobbly, light col. variant	.32	4	12.5	.32	3	9.4
Iredell	.49	2	4.1	.49	1	2.0
Iredell stony	.49	2	4.1	.49	1	2.0
Iredell very stony	.43	2	4.7	.43	1	2.3
Jefferson	.32	4	12.5	.32	3	9.4

TABLE 1  
"K" & "T" Factors  
Soil Loss Prediction Study  
Virginia  
Blue Ridge & Piedmont

	1 and 2 Erosion			3 Erosion		
	K	T	T/K	K	T	T/K
Jefferson cobbly	.28	4	14.3	.28	3	10.7
Kelly	.43	3	7.0	.43	2	4.7
Lansdale	.32	4	12.5	.32	3	9.4
Legore (Ruxton)	.28	3	10.7	.28	2	7.1
Legore stony	.24	3	12.5	.24	2	8.3
Legore very stony	.20	2	10.0	.20	1	5.0
Lehigh*	.43	2	4.7	.43	1	2.3
Lehigh shaly	.28	2	7.1	.28	1	3.6
Lignum	.37	3	8.1	.37	2	5.4
Lloyd	.37	4	10.8	.37	3	8.1
Lloyd very stony	.24	3	12.5	.24	2	8.3
Louisa	.37	2	5.4	.37	1	2.7
Louisa angular cobbly	.32	2	6.2	.32	1	3.1
Louisburg	.32	2	6.2	.32	1	3.1
Louisburg coarse gritty	.28	2	7.1	.28	1	3.6
Louisburg stony	.28	2	7.1	.28	1	3.6
Louisburg very stony	.20	2	10.0	.20	1	5.0
Madison	.37	4	10.8	.37	3	8.1
Madison gravelly	.32	4	12.5	.32	3	9.4
Madison cobbly	.32	4	12.5	.32	3	9.4
Manassas	.32	4	12.5	.32	3	9.4
Mangum	.43	2	4.7	.43	1	2.3
Manor	.37	3	8.1	.37	2	5.4
Manor very stony	.24	2	8.3	.24	1	4.2
Manteo	.37	2	5.4	.37	1	2.7
Manteo shaly	.24	2	8.3	.24	1	4.2
Masada	.37	4	10.8	.37	3	8.1
Masada gravelly	.32	4	12.5	.32	3	9.4
Masada cobbly	.32	4	12.5	.32	3	9.4
Matney	.32	4	12.5	.32	3	9.4
Mayodan	.37	4	10.8	.37	3	8.1
Mayodan gravelly	.32	4	12.5	.32	3	9.4
Meadowville	.37	3	8.1	.37	2	5.4
Meadowville cobbly	.32	3	9.4	.32	2	6.2
Mecklenburg	.43	3	7.0	.43	2	4.7
Molena	.20	4	20.0			
Montalto	.32	4	12.5	.32	3	9.4
Montalto stony	.28	4	14.3	.28	3	10.7

\*Lehigh in Virginia differs from official concept in NE and is under study for proper classification.



TABLE 1  
"K" & "T" Factors  
Soil Loss Prediction Study  
Virginia

Blue Ridge & Piedmont

	1 and 2 Erosion			3 Erosion		
	K	T	T/K	K	T	T/K
Montalto very stony	.20	3	15.0	.20	2	10.0
Myersville	.32	4	12.5	.32	3	9.4
Myersville stony	.28	3	10.7	.28	2	7.1
Myersville very stony	.20	2	10.0	.20	1	5.0
Nason	.37	4	10.8	.37	3	8.1
Nason gravelly	.32	4	12.5	.34	3	9.4
Orange	.49	2	4.1	.49	1	2.0
Orange gravelly subsoil phase	.49	2	4.1	.49	1	2.0
Orange stony	.49	2	4.1	.49	1	2.0
Orange very stony	.43	2	4.7	.43	1	2.3
Penn	.37	2	5.4	.37	1	2.7
Penn shaly	.24	2	8.3	.24	1	4.2
Piney	.43	2	4.7	.43	1	2.3
Pinkston	.43	2	4.7	.43	1	2.3
Porters	.28	2	7.1	.28	1	3.7
Porters coarse gritty	.24	2	8.3	.24	1	4.2
Porters stony	.24	2	8.3	.24	1	4.2
Porters very stony	.20	2	10.0	.20	1	5.0
Rabun	.37	4	10.8	.37	3	8.1
Rabun very stony	.24	3	12.5	.24	2	8.3
Ramsey	.32	1	3.1	.32	1	3.1
Ramsey shaly	.24	1	4.2	.24	1	4.2
Ramsey stony	.28	1	3.7	.28	1	3.7
Ramsey very stony	.20	2	10.0	.20	1	5.0
Ranger	.37	2	5.4	.37	1	2.7
Ranger slaty	.24	2	8.3	.24	1	4.2
Rapidan	.37	4	10.8	.37	3	8.1
Raritan	.43	3	7.0	.43	2	4.7
Readington	.43	3	7.0	.43	2	4.7
Rohrersville	.43	3	7.0	.43	2	4.7
Rohrersville stony	.43	3	7.0	.43	2	4.7
Rohrersville very stony	.37	2	5.4	.37	1	2.7
Ruxton very stony	.20	2	10.0	.20	1	5.0
Starr	.32	4	12.5	.32	3	9.4
State	.28	4	14.3	.28	3	10.7
State gravelly	.24	3	12.5	.24	2	8.3
State cobbly	.24	3	12.5	.24	2	8.3
Steinsburg	.43	2	4.7	.43	1	2.3
Surry	.37	4	10.8	.37	3	8.1

TABLE 1  
"K" & "T" Factors  
Soil Loss Prediction Study  
Virginia

Blue Ridge & Piedmont

	1 and 2 Erosion			3 Erosion		
	K	T	T/K	K	T	T/K
Sylvatus	.37	3	8.1	.37	2	5.4
Sylvatus channery	.32	3	6.2	.32	1	3.1
Talladega	.32	2	6.2	.32	1	3.1
Tatum	.37	4	10.8	.37	3	8.1
Tatum gravelly	.32	4	12.5	.32	3	9.4
Thurmont	.32	4	12.5	.32	3	9.4
Thurmont gravelly	.24	4	16.7	.24	3	12.5
Thurmont cobbly	.24	4	16.7	.24	3	12.5
Thurmont stony	.20	3	15.0	.20	2	10.0
Thurmont very stony	.17	2	11.7	.17	1	5.9
Tirzah	.37	4	10.8	.37	3	8.1
Trego	.43	3	7.0	.43	2	4.7
Tusquitee	.24	4	16.7	.24	3	12.5
Tusquitee cobbly	.20	4	20.0	.20	3	15.0
Tusquitee stony	.20	4	20.0	.20	3	15.0
Tusquitee very stony	.17	3	17.6	.17	2	11.7
Unison	.28	4	14.3	.28	3	10.7
Unison cobbly	.28	4	14.3	.28	3	10.7
Unison stony	.24	4	16.7	.24	3	12.5
Unison very stony	.24	3	12.5	.24	2	8.3
Vance	.43	3	7.0	.43	2	4.7
Wadesboro	.37	4	10.8	.37	3	8.1
Watauga	.32	3	9.4	.32	2	6.2
Watauga cobbly	.28	3	10.7	.28	2	8.3
Watt	.43	3	7.0	.43	2	4.7
Whiteford	.28	3	10.7	.28	2	7.1
Whiteford stony	.24	2	8.3	.24	1	4.2
Whiteford very stony	.20	2	10.0	.20	1	5.0
White Store	.49	2	4.1	.49	1	2.0
Wickham*	.28	4	14.3	.28	3	10.7
Wickham, thick surface phase	.20	4	20.0	.20		
Wickham gravelly	.24	4	16.7	.24	3	12.5
Wickham cobbly	.24	4	16.7	.24	3	12.5

\*Wickham in NC & SE is finer textured in subsoil than in Virginia.

TABLE 1  
 "K" & "T" Factors  
 Soil Loss Prediction Study  
 Virginia

Blue Ridge & Piedmont

	1 and 2 Erosion			3 Erosion		
	K	T	T/K	K	T	T/K
Wilkes	.43	2	4.7	.43	1	2.3
Wilkes cobbly	.37	2	5.4	.37	1	2.7
Worsham	.43	2	4.7	.43	1	2.3
Worsham gravelly	.37	2	5.4	.37	1	2.7
Worsham stony	.37	2	5.4	.37	1	2.7
Worsham very stony	.32	2	6.2	.32	1	3.1
Yadkin	.37	4	10.8	.37	3	8.1
York	.32	3	9.4	.32	2	6.2
Zion	.37	2	5.4	.37	1	2.7

TABLE 2

Rainfall - Erosion Index  
Factor "R" Values by Counties

Charles City	250
Dinwiddie	250
Goochland	175
Greensville	250
Hampton (City)	300
Hanover	200
Henrico	225
Isle of Wight	250
James City	300
Nansemond	300
New Kent	225
Newport News (City)	300
Norfolk	300
Powhatan	200
Prince George	250
Southampton	250
Surry	250
Sussex	250
York	250

TABLE 3

Practice Factor Values  
Soil Loss Prediction Study  
Virginia

<u>Percent Slope</u>	<u>Up &amp; Down Hill</u>	<u>Contouring</u>	<u>Contour Stripcropping</u>
1.1 - 2.0	1.0	0.60	0.30
2.1 - 7.0	1.0	0.50	0.25
7.1 - 12.0	1.0	0.60	0.30
12.1 - 18.0	1.0	0.80	0.40
18.1 - 24.0	1.0	0.90	0.45

TABLE 4  
 "C" Factor Values for Cropping Systems  
 Soil Loss Prediction Study  
 Virginia

Coastal Plain

Established Grasses and Legumes  
 (When used continuously)

Management Information					
Cropping Sequence		Date Planted	Date Harv.	Residue Use	Yields C Value
Meadow	Excellent sod and cover	Est.			2-3T .004
Meadow	Good sod and cover	Est.			1-2T .006
Meadow	Fair sod and cover	Est.			1T .010
A. Lesp.	All year average	Est.		RdL	Seed .010
S. Lesp.	After established				.010
Red cl.	All year average				2T .015
A. Lesp.	All year average				.020
A. Lesp.	Plowed seedbed	2-15	8-15	RdR	Hay .136
	Continuous follow				1.00

Cropping Sequences /1

Cropping Sequence	Conventional Tillage		Minimum Tillage	
	RdR <u>/2</u>	RdL <u>/3</u>	RdR	RdL
<u>C</u>	.442	.338	.399	.260
<u>Cc</u>	.412	.316	.337	.195
<u>C SB</u>		.354		.298
<u>Peanuts<sub>c</sub> C</u>		.316		.256

/1 Factors figured on yields of 75 bu or over of corn

/2 RdR - Residues removed

/3 RdL - Residues left

TABLE 4  
Coastal Plain (Cont'd)  
Cropping Sequences /1

Cropping Sequence	Conventional Tillage		Minimum Tillage	
	RdR <u>/2</u>	RdL <u>/3</u>	RdR	RdL
<u>Peanuts</u> <sub>C</sub> <u>C</u> <u>C</u>		.333		.258
<u>Peanuts</u> <sub>C</sub> <u>S</u> <u>B</u> <u>C</u>		.355		.302
<u>C</u> <u>G</u> <u>SB</u>		.267		.249
<u>Peanuts</u> <u>G</u> <u>C</u>		.279		.242
<u>C</u> <u>G</u> <u>Lesp.</u>		.146		.097
<u>C</u> <u>G</u>		.208		.150
<u>C</u> <u>(GH)</u> <u>H</u>	.067		.051	
<u>C</u> <sub>C</sub> <u>C</u> <u>H</u> <u>H</u>	.146		.111	

/1 Factors figured on yields of 75 bu or over of corn

/2 RdR - Residues removed

/3 RdL - Residues left

TABLE 4  
 "C" Factor Values for Cropping Systems  
 Soil Loss Prediction Study  
 Virginia

Piedmont  
 Established Grasses and Legumes  
 (When used continuously)

Management Information					
Cropping Sequence		Date Planted	Date Harv.	Residue Use	Yields C Value
Meadow	Excellent sod and cover	Est.			2-3T .004
Meadow	Good sod and cover	Est.			1-2T .006
Meadow	Fair sod and cover	Est.			1T .010
A. Lesp.	All year average	Est.		RdL	Seed .010
S. Lesp.	After established				.010
Red cl.	All year average				2T .015
A. Lesp.	All year average				.020
A. Lesp.	Plowed seedbed	2-15	8-15	RdR	Hay .136
	Continuous follow				1.00

Cropping Sequences /1

Cropping Sequence	Conventional Tillage		Minimum Tillage	
	RdR <u>/2</u>	RdL <u>/3</u>	RdR	RdL
	F-.497	F-.379		
<u>C</u>	S-.443	S-.353	S-.353	.231
<u>Cc</u>	S.359	.311	.231	.205
<u>C Sg</u>	.245		.198	

/1 Factors figured on yields of 75 bu or over of corn

/2 RdR - Residues removed

/3 RdL - Residues left

TABLE 4  
Piedmont (Cont'd)  
Cropping Sequences /1

Cropping Sequence	Conventional Tillage		Minimum Tillage	
	RdR <u>/2</u>	RdL <u>/3</u>	RdR	RdL
<u>C(Sg-Lesp)</u>	.189	.124	.145	.080
<u>C-Sg-Lesp-Lesp</u>	.135	.091	.105	.062
<u>C-Sp.Oats-Lesp</u>	.252	.158	.161	.114
<u>C-Smgr. S.B.</u>	.362	.230	.342	.185
<u>C-O-Lesp-H</u>	.117	.114	.115	.084
<u>(G Lesp) H(1-2T)</u>	.073			
<u>(G Lesp) H(2-3T)</u>	.029			
<u>Sorghum G(Silage)</u>	.320			
<u>C (Sg.H) H</u>	.077	.048	.061	.032
<u>C (SGH) H H</u>	.058	.037	.047	.025
<u>C (SGH) H H H</u>	.048	.030	.038	.021
<u>C(SCH) H H H H</u>	.040	.029	.033	.018
<u>C C(SgH) H</u>	.151	.103	.095	.071
<u>C C (SgH) H H</u>	.121	.083	.077	.058
<u>C C(SgH) H H H</u>	.108	.070	.064	.047
<u>C C(SgH) H H H H</u>	.088	.061	.056	.041
<u>CcC(SgH) H</u>	.155	.101	.100	.070
<u>CcC (SgH) H H</u>	.125	.081	.081	.057
<u>CcC(SgH) H H H</u>	.105	.069	.068	.048

/1 Factors figured on yields of 75 bu or over of corn

/2 RdR - Residues removed

/3 RdL - Residues left



TABLE 4  
Piedmont (Cont'd)  
 Cropping Sequences /1

Cropping Sequence	Conventional Tillage		Minimum Tillage	
	RdR <u>/2</u>	RdL <u>/3</u>	RdR	RdL
C C(SgH)H H H H	.090	.059	.059	.041
<u>Tob<sub>c</sub></u> continuous		.422		
<u>Tob</u> continuous		.540		
<u>Tob (Smgr Weeds) W</u>		.089		
<u>Tob (Smgr Fesc) Fesc</u>		.078		
<u>Tob, tob, SgFescue, Fesc</u>		.180		

/1 Factors figured on yields of 75 bu or over of corn

/2 RdR - Residues removed

/3 RdL - Residues left

## Slope Length and Steepness

by Dwight D. Smith /1

Solution of the soil loss equation is made easier by combining the equations of the factors for length and percent of slope. With "K" factor values in terms of soil loss per rainfall-erosion index unit from a slope of 9 percent and length of 72.6 feet, the equation for "SL" reduces to the following.

$$SL = \sqrt{\frac{L_p}{100}} (0.76 + 0.54s + 0.076s^2)$$

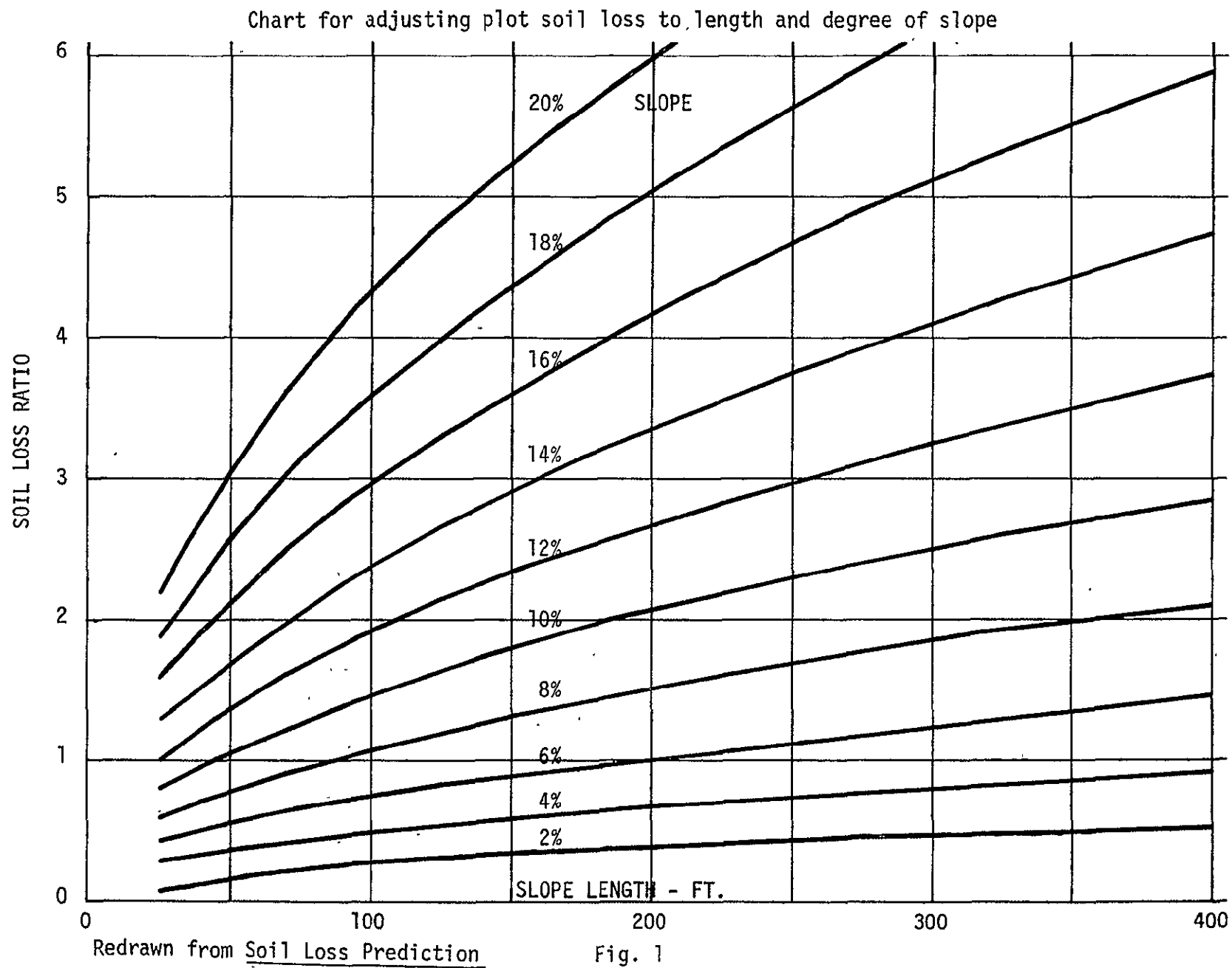
in which "s" is percent slope and "Lp" is slope length in feet.

Either charts or tables for easy selection of "SL" values may be prepared from the equation. The family of curves shown in Figure 1 was prepared from the equation and is suggested for use in solution of the universal equation.

The "S" and "L" factors of the erosion equation need additional research attention. There is evidence of interaction of the length factor with soil characteristics that affect runoff, detachment and transportability, the rainfall-erosion index and steepness of slope. Lower values of the slope length exponent "m" were found to be associated with soils on which runoff amount decreased with increased slope length. Values of "m" ranged from a little above zero on the Austin silty clay soil at Temple, Texas to 0.90 for the Shelby silt loam at Bethany, Missouri and averaged 0.50. The percent slope factor

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is known to interact with practices such as contouring and may interact with other factors. Both factors are under study at the U.S. Run-off and Soil Loss Data Laboratory and at other locations.



JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

EXTENDED, December 1950 to September 1951.--Sediment concentrations: Maximum daily observed, 645 ppm Apr. 1; minimum daily observed, 2 ppm July 3, 8, 10.  
Sediment loads: Maximum daily observed, 60,000 tons Apr. 1; minimum daily observed, 9 tons July 10.  
Suspended sediment, December 1950 to September 1951

Day	October			November			December		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----							--	--	--
2-----							--	--	--
3-----							--	--	--
4-----							--	--	--
5-----							--	--	--
6-----							--	--	--
7-----							--	--	--
8-----							--	--	--
9-----							--	--	--
10-----							--	--	--
11-----							--	--	--
12-----							--	--	--
13-----							--	--	--
14-----							--	--	--
15-----							--	--	--
16-----							--	--	--
17-----							--	--	--
18-----							--	--	--
19-----							--	--	--
20-----							--	--	--
21-----							3,990	12	129
22-----							3,990	10	103
23-----							3,810	4	41
24-----							3,630	7	69
25-----							3,540	8	76
26-----							3,810	5	51
27-----							3,280	8	71
28-----							3,200	9	78
29-----							3,200	8	69
30-----							3,900	14	148
31-----							3,120	6	51
Total--							39,470	--	891
Day	January			February			March		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	3,370	9	82	4,360	15	184	6,220	16	269
2-----	3,370	6	55	5,010	48	649	6,010	19	309
3-----	2,860	11	85	15,100	245	a10,000	5,410	21	307
4-----	3,280	19	166	13,500	179	a5,500	5,010	19	257
5-----	2,780	14	105	9,600	98	2,540	4,820	15	195
6-----	3,120	16	152	8,170	52	1,150	4,820	12	155
7-----	3,120	4	34	9,680	50	1,330	4,820	11	143
8-----	3,720	9	90	24,300	242	a15,000	4,630	14	175
9-----	3,620	11	103	22,700	179	a11,000	4,720	13	166
10-----	3,200	8	69	14,000	115	4,340	5,210	8	113
11-----	3,720	8	80	10,400	75	2,110	5,210	5	a70
12-----	3,460	11	103	8,870	43	1,030	5,010	4	54
13-----	3,370	11	100	8,400	40	a900	5,010	14	a190
14-----	3,630	10	98	7,280	35	a700	11,500	276	a8,600
15-----	3,540	22	210	7,720	30	625	11,500	148	a4,600
16-----	4,080	27	298	7,940	19	407	10,400	53	1,490
17-----	3,980	15	162	8,630	25	582	8,630	37	862
18-----	5,610	19	298	9,600	36	933	7,720	22	459
19-----	4,820	18	234	11,800	54	1,720	7,940	31	654
20-----	4,720	12	153	11,500	36	1,180	20,400	123	a5,800
21-----	4,440	11	132	10,400	26	730	22,700	170	a10,000
22-----	3,900	4	42	11,200	44	1,330	19,200	135	a5,500
23-----	3,810	5	51	16,000	98	a4,200	15,000	67	2,720
24-----	3,900	17	178	14,000	54	2,040	12,400	45	1,510
25-----	3,990	15	162	10,600	36	1,030	10,600	32	916
26-----	4,080	16	176	8,870	27	646	10,400	21	550
27-----	5,610	21	318	8,170	18	397	9,350	13	328
28-----	5,010	20	270	7,060	14	267	8,400	10	227
29-----	4,720	15	191	--	--	--	7,940	16	343
30-----	4,440	10	120	--	--	--	7,500	24	486
31-----	4,540	15	184	--	--	--	16,100	212	a9,200
Total--	121,820	--	4,498	305,060	--	74,520	284,580	--	58,699

a Computed from estimated concentration graph.

Source: Connor & Schroeder (1957)

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JAMES RIVER AT BALTIMORE--Continued

JAMES RIVER AT DOTTSVILLE, VA.--Continued

Suspended sediment, December 1950 to September 1951--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	54,500	8.2	450,000	6,540	20	350	2,500	10	70
2-----	21,100	3.50	719,000	6,400	20	430	2,600	5	50
3-----	23,500	2.16	516,000	6,010	20	350	2,500	4	29
4-----	21,100	2.45	450,000	7,000	19	400	3,100	16	120
5-----	14,000	7.0	980,000	7,280	33	640	1,600	120	1,920
6-----	11,500	20	2,300	6,010	44	265	6,010	456	2,700
7-----	11,400	3.6	1,100	6,010	27	400	7,000	105	2,000
8-----	10,000	2.0	200,000	6,600	20	330	6,400	41	1,400
9-----	10,100	3.2	1,000	6,400	20	330	5,810	165	2,000
10-----	13,500	1.20	150,000	6,010	20	330	10,100	294	6,000
11-----	10,000	1.50	150,000	5,610	20	330	12,100	277	7,400
12-----	10,000	9.2	920,000	5,410	23	330	11,200	120	3,600
13-----	10,000	1.30	130,000	5,010	25	300	16,000	209	17,000
14-----	31,000	2.73	18,700	6,430	21	360	30,500	485	50,400
15-----	21,500	1.07	6,100	6,220	20	330	30,500	347	108,000
16-----	15,000	58	2,510	5,010	20	271	18,900	153	7,610
17-----	12,700	32	1,100	4,540	18	221	12,400	79	2,500
18-----	10,400	27	750	4,260	18	207	9,600	48	1,240
19-----	9,110	24	590	4,350	10	273	8,870	43	1,030
20-----	8,040	21	479	4,170	18	205	8,400	37	639
21-----	7,940	15	322	3,540	14	134	7,060	35	668
22-----	7,050	22	419	3,890	14	151	6,420	52	1,900
23-----	8,170	46	1,010	3,990	21	226	6,010	108	1,760
24-----	8,630	55	1,200	3,000	15	150	5,010	40	541
25-----	8,400	42	952	3,720	13	130	4,540	20	245
26-----	8,630	32	746	3,460	15	140	3,610	14	144
27-----	8,170	27	595	3,030	9	74	3,810	12	123
28-----	7,500	29	507	3,200	9	78	3,370	8	73
29-----	7,060	28	531	3,370	11	100	3,370	6	55
30-----	6,540	19	341	2,940	9	71	3,460	7	65
31-----	--	--	--	2,690	4	58	--	--	--
Total--	449,650	--	152,075	156,780	--	8,794	273,400	--	160,531
Day	July			August			September		
	Mean discharge (cfs-days)	Suspended sediment		Mean discharge (cfs-days)	Suspended sediment		Mean discharge (cfs-days)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	3,630	7	69	2,450	27	179	1,060	6	18
2-----	3,200	3	26	2,140	20	116	1,030		
3-----	2,780	2	15	2,140	22	127	1,190		
4-----	2,780	5	38	1,620	15	66	1,310	9	32
5-----	2,690	4	29	1,870	19	101	1,440		
6-----	2,270	3	19	2,420	25	163	1,190		
7-----	2,450	3	20	1,360	5	16	1,060	10	30
8-----	2,530	2	14	2,210	14	84	1,220		
9-----	2,210	5	30	1,910	22	113	1,140		
10-----	1,690	2	9	2,280	74	456	1,010	9	26
11-----	2,210	3	18	2,140	29	169	1,040		
12-----	1,760	8	38	1,690	11	50	1,190		
13-----	1,570	10	42	1,690	8	37	1,050	12	37
14-----	2,370	24	154	1,760			922		
15-----	3,200	57	493	1,690			1,140		
16-----	6,540	150	2,690	2,060	7	31	1,190	12	39
17-----	4,820	168	2,190	1,980			1,060		
18-----	3,370	40	364	1,590			1,190	10	25
19-----	3,120	32	270	1,370	4	14	1,420		
20-----	2,780	24	180	1,240			1,100		
21-----	2,140	24	139	1,580			1,110	6	15
22-----	2,140	43	248	1,290	9	33	860		
23-----	1,910	37	191	1,190			1,080		
24-----	2,530	62	420	1,140	4	12	890	10	25
25-----	3,820	90	1,130	1,240			988		
26-----	3,990	224	2,410	890			900	6	15
27-----	4,440	115	1,380	1,120	9	33	933		
28-----	3,630	45	442	1,230			977		
29-----	2,780	32	240	1,530	9	33	922	6	15
30-----	2,690	20	145	1,290			800		
31-----	2,370	22	142	1,290			--	--	--
Total--	90,610	--	13,595	51,500	--	2,110	32,412	--	836
Total discharge for period (cfs-days)-----									
Total load for period (tons)-----									
a Computed by subdividing day.									
b Computed from estimated concentration graph.									

Source: Connor & Schroeder (1957)

# REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

EXTREMES, 1951-52.--Sediment concentrations: Maximum daily, 915 ppm Mar. 12; minimum daily, 2 ppm June 27-29, July 30.  
Sediment loads: Maximum daily, 120,000 tons Mar. 12; minimum daily, 6 tons July 30.

Suspended sediment, water year October 1951 to September 1952

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,190	5	12	3,040	149	a1,900	1,420	7	28
2-----	730			5,300	355	a6,000	1,560		
3-----	673			3,410	177	a2,870	1,400		
4-----	922			3,810	95	977	1,420		
5-----	770			2,450	28	185	7,470		
6-----	900	4	10	2,060	16	89	7,180	266	5,160
7-----	860			3,460	38	355	6,010	79	1,280
8-----	1,050			3,120	56	472	4,720	44	561
9-----	1,140			2,210	27	161	3,370	29	264
10-----	966	7	19	2,210	13	78	3,200	28	242
11-----	933			2,060	11	61	2,690	20	145
12-----	911			1,840	9	42	2,370	15	96
13-----	640			1,910			2,690	19	138
14-----	820			1,520			2,210	15	90
15-----	870			1,690			3,030	19	155
16-----	890	5	11	1,840	9	44	3,460	28	262
17-----	850			1,690			3,200	27	233
18-----	650			1,910			4,820	24	312
19-----	850			1,250			4,720	18	229
20-----	850			1,690			3,810	47	483
21-----	860	6	16	1,490	9	34	25,000	785	a57,300
22-----	900			1,310			20,000	454	24,500
23-----	955			1,390			17,000	292	13,400
24-----	999			1,520			12,000	186	6,030
25-----	1,090			1,520			8,000	77	1,660
26-----	1,100	5	14	1,250	8	30	6,500	41	720
27-----	1,060			1,450			6,400	40	691
28-----	977			1,410			6,200	28	459
29-----	1,010			1,230			6,000	15	243
30-----	955			1,390			5,810	12	168
31-----	928	7	19	--	--	--	4,630	6	100
Total--	28,759	--	425	64,430	--	13,844	188,310	--	129,741
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4,540	9	110	13,000	47	1,650	4,720	9	115
2-----	5,410	11	161	10,400	29	614	4,540	9	110
3-----	8,630	34	792	9,850	19	505	4,630	9	113
4-----	7,940	24	515	28,000	268	a21,400	5,410	17	248
5-----	7,940	22	472	31,400	316	26,800	6,220	19	319
6-----	9,110	46	1,130	23,100	210	13,100	9,350	33	833
7-----	11,200	46	1,390	16,400	84	3,720	9,850	29	771
8-----	8,870	26	623	12,700	60	2,060	8,170	17	375
9-----	7,500	19	365	10,600	38	1,090	7,720	18	376
10-----	6,850	27	499	9,110	27	664	6,430	17	295
11-----	7,720	36	750	8,400	22	499	15,900	495	a36,000
12-----	11,800	46	1,470	7,720	29	604	48,600	915	120,000
13-----	9,600	45	1,170	6,850	29	536	45,100	599	72,900
14-----	7,940	27	579	6,640	19	341	22,300	243	14,600
15-----	6,850	17	314	6,220	14	235	15,300	112	4,630
16-----	6,010	12	195	6,430	15	260	11,800	58	1,850
17-----	5,410	11	161	8,400	28	635	9,850	42	1,120
18-----	4,820	10	130	9,850	22	585	8,870	33	790
19-----	5,810	19	298	11,500	26	869	13,400	153	5,540
20-----	11,800	57	1,820	9,600	30	778	15,300	182	7,520
21-----	9,110	34	836	8,630	19	443	17,400	88	4,130
22-----	9,110	40	984	7,720	21	438	14,300	83	2,430
23-----	14,000	136	5,140	6,640	14	251	19,600	137	7,250
24-----	19,600	84	4,450	6,220	11	185	21,500	174	10,100
25-----	15,700	118	5,000	5,610	9	136	25,100	184	12,500
26-----	11,800	70	2,230	5,210	9	127	17,800	98	4,710
27-----	11,000	37	1,100	5,010	8	106	14,000	58	2,190
28-----	17,000	176	8,080	4,720	11	140	11,500	38	1,180
29-----	35,000	356	33,600	4,260	9	104	10,100	28	764
30-----	25,000	182	12,300	--	--	--	9,110	33	812
31-----	20,000	65	3,510	--	--	--	8,170	27	586
Total--	343,070	--	90,194	300,180	--	79,077	442,040	--	315,166

a Computed by subdividing day.

Source: Schroeder & Kapustka (1957)

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Suspended sediment, water year October 1951 to September 1952--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	7,550	30	60.1	16,000	81	3,500	4,820	15	195
2-----	7,550	26	55.0	12,400	47	1,570	4,410	6	96
3-----	7,060	23	43.8	10,100	31	945	4,080	11	121
4-----	7,230	24	47.2	8,870	24	575	3,810	17	175
5-----	7,500	25	50.6	8,170	22	485	3,280	7	62
6-----	7,500	40	81.0	6,640	18	323	3,280	3	27
7-----	8,870	34	81.4	6,430	16	278	3,030	3	25
8-----	8,870	22	57.7	5,610	14	212	2,610	3	21
9-----	9,400	18	40.8	5,410	13	190	2,780	3	23
10-----	7,060	27	51.5	6,010	19	308	2,690	4	29
11-----	6,220	23	38.6	7,060	71	1,350	2,530	5	34
12-----	6,220	16	26.9	19,600	231	12,200	2,530	3	20
13-----	5,810	15	23.5	17,100	129	5,860	2,290	5	31
14-----	5,810	14	21.2	13,000	53	1,860	2,370	6	38
15-----	5,810	15	23.5	10,400	32	899	2,450	10	66
16-----	6,640	29	52.0	8,870	20	479	2,450	12	79
17-----	6,650	36	66.0	7,940	18	343	2,140	9	52
18-----	6,010	20	32.5	6,650	20	370	2,370	9	58
19-----	5,810	15	23.5	6,220	16	269	2,210	9	54
20-----	5,410	15	21.9	6,220	16	269	1,980	4	21
21-----	4,820	19	24.7	6,220	15	252	1,910	8	41
22-----	4,820	15	19.5	5,610	15	227	1,980	5	27
23-----	4,170	9	10.1	5,410	16	234	2,210	18	107
24-----	5,010	15	20.3	5,410	15	219	3,370	36	328
25-----	6,890	97	2,320	5,810	34	533	2,060	14	78
26-----	18,500	218	10,900	5,410	44	643	2,290	4	25
27-----	19,800	249	13,200	6,010	27	436	1,980	2	11
28-----	24,300	327	21,500	6,430	21	355	1,690	2	9
29-----	28,400	203	15,600	6,220	21	353	1,760	2	10
30-----	23,900	162	11,700	5,410	31	453	1,910	5	26
31-----	--	--	--	4,630	22	275	--	--	--
Total--	280,040	--	84,916	251,470	--	36,277	79,300	--	1,859
Day	July			August			September		
	Mean discharge (cfs-days)	Suspended sediment		Mean discharge (cfs-days)	Suspended sediment		Mean discharge (cfs-days)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2,370	41	25	1,350	6	22	22,300	570	244,900
2-----	1,940	10	50	1,410	13	49	14,000	286	10,800
3-----	1,520	3	13	3,630	112	1,100	9,110	95	2,340
4-----	1,520	21	92	2,210	37	221	5,810	71	1,110
5-----	2,290	24	148	2,140	15	87	4,170	48	540
6-----	2,050	28	155	2,140	17	98	3,720	37	372
7-----	2,140	19	110	2,780	38	285	2,940	20	159
8-----	2,690	39	283	5,010	191	2,330	2,290	9	55
9-----	5,820	847	214,400	10,100	533	14,500	2,610	12	85
10-----	3,480	170	159	15,700	488	20,700	2,450	12	79
11-----	2,530	48	328	9,350	253	6,390	1,840	}	37
12-----	2,140	24	139	6,220	143	2,400	2,050		
13-----	1,980	18	96	5,010	65	879	1,980		
14-----	1,910	11	57	3,720	43	432	1,940	5	25
15-----	1,480	9	36	2,610	28	197	1,760	4	19
16-----	1,940	9	45	3,900	45	474	1,690	4	18
17-----	1,940	19	102	4,250	114	1,310	1,620	4	17
18-----	1,750	14	67	3,540	74	707	1,590	4	18
19-----	2,290	19	117	3,370	54	491	1,610	}	243
20-----	1,940	12	60	2,780	32	240	2,140		
21-----	1,690	6	27	3,030	32	252	3,200	40	346
22-----	1,590	5	23	2,450	28	185	2,370	12	77
23-----	1,390	3	11	2,780	28	210	2,290	5	31
24-----	1,530	3	12	2,450	21	139	2,370	8	51
25-----	1,520	}	10	2,370	28	179	1,640	4	20
26-----	1,370			2,060	18	100	2,050	4	22
27-----	1,240			1,590	9	41	2,140	3	17
28-----	1,160	}	6	1,590	9	41	1,590	3	14
29-----	1,160			1,910	8	41	1,510	4	17
30-----	1,120			1,510	4	17	1,590	8	34
31-----	1,540	4	17	1,620	17	74	--	--	--
Total--	61,170	--	16,530	114,900	--	55,201	108,790	--	61,539
Total discharge for year (cfs-days)--									2,262,519
Total load for year (tons)--									884,939

s Computed by subdividing day.



REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR.

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Nov. 1952-53.--Sediment concentrations: Maximum daily, 846 ppm Feb. 23; minimum daily, 2 ppm on several days in July, August, and September.  
Sediment loads: Maximum daily, 120,000 tons Feb. 23; minimum daily, 3 tons Sept. 1-5.

Suspended sediment, water year October 1952 to September 1953

Day	October			November			December		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,690	6	27	1,290			2,780	24	180
2-----	1,530	5	21	1,190	7	24	2,860	9	69
3-----	1,540			1,340			2,530	8	55
4-----	1,440	4	16	1,420	8	31	2,060	11	85
5-----	1,420			1,140	8	25	2,420	8	52
6-----	1,410			1,320			2,690	7	51
7-----	1,400	5	19	1,310	9	32	2,860	7	69
8-----	1,440			1,320			2,060	7	46
9-----	1,410			1,180	6	19	3,120	5	42
10-----	1,690	4	19	1,360	6	27	2,860	4	31
11-----	2,060			1,240	7	23	7,620	104	2,140
12-----	2,450	8	53	1,540			18,100	247	12,100
13-----	1,890	6	27	1,340	8	30	16,700	2,2	10,600
14-----	1,840	4	20	1,350			10,100	111	3,030
15-----	1,560	8	34	2,420	39	255	7,940	64	1,370
16-----	1,620	7	31	3,810	71	730	6,220	37	621
17-----	1,450	3	12	2,210	28	167	5,210	27	380
18-----	1,440	3	12	1,980	21	112	4,170	20	225
19-----	1,440	4	16	1,690	24	110	4,080	14	154
20-----	1,520			7,250	101	3,740	4,070	12	132
21-----	1,340			15,000	277	11,200	3,630	9	88
22-----	1,180	9	32	13,500	134	4,810	3,540	12	115
23-----	1,240			10,400	80	2,350	3,630	11	108
24-----	1,320			8,400	61	1,390	3,990	10	106
25-----	1,320			6,430	38	660	4,260	10	115
26-----	1,190	7	25	5,010	28	379	3,720	10	100
27-----	1,390			4,260	21	242	3,720	8	60
28-----	1,370			3,460	14	131	3,540	6	57
29-----	1,450	9	32	3,120	14	118	3,120	6	51
30-----	1,700			3,120	10	84	3,280	8	71
31-----	1,250			--	--	--	3,370	10	92
Total--	46,290	--	778	110,200	--	26,746	151,650	--	32,716
Day	January			February			March		
	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	5,410	39	570	6,010	18	292	7,940	28	600
2-----	5,010	52	702	5,210	13	183	6,850	23	425
3-----	5,810	46	722	5,010	16	216	6,850	23	425
4-----	5,210	21	318	4,820	14	182	7,280	60	1,570
5-----	5,510	21	318	4,350	14	164	10,100	109	2,970
6-----	5,210	15	227	4,170	11	124	17,800	114	5,430
7-----	5,210	13	163	4,260	16	184	16,400	69	3,940
8-----	4,440	14	168	5,010	14	189	12,100	49	1,600
9-----	5,210	15	211	5,010	12	162	10,400	28	796
10-----	12,200	113	3,720	6,850	14	259	8,870	23	551
11-----	17,600	157	7,550	5,810	19	298	8,170	20	441
12-----	16,700	96	4,330	5,410	19	278	7,720	18	375
13-----	12,400	61	2,040	5,210	19	267	10,100	63	1,720
14-----	9,740	37	934	5,210	16	225	9,850	39	1,040
15-----	8,170	24	529	6,640	60	1,080	9,350	33	633
16-----	7,540	20	359	8,630	61	1,420	11,200	79	2,390
17-----	6,220	30	504	9,400	39	1,010	16,400	84	3,720
18-----	5,510	18	273	8,870	29	695	14,000	66	2,430
19-----	5,410	22	402	8,170	22	485	12,700	39	1,340
20-----	5,010	22	298	7,280	15	295	12,100	24	784
21-----	5,010	14	164	11,100	125	3,750	11,500	16	559
22-----	6,430	34	590	42,300	826	108,000	9,650	18	479
23-----	6,850	31	573	50,900	849	126,000	8,870	16	383
24-----	10,500	78	2,210	22,700	227	13,900	19,000	238	12,200
25-----	16,400	153	6,770	15,300	104	4,300	56,400	595	90,600
26-----	15,700	70	2,970	12,100	62	2,030	45,700	317	39,100
27-----	12,400	53	1,770	9,850	56	1,490	25,100	132	8,950
28-----	9,600	33	855	8,870	45	1,080	18,100	71	3,470
29-----	8,170	37	816	--	--	--	14,000	43	1,630
30-----	7,280	22	432	--	--	--	11,500	30	932
31-----	6,850	13	240	--	--	--	9,850	22	555
Total--	258,620	--	41,854	294,650	--	268,558	446,050	--	192,368

a Load computed by subdividing day.

Source: Schroeder & Kapustka (1957)

## JAMES RIVER BASIN--Continued

## JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Suspended sediment, water year October 1952 to September 1953--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	9,110	16	394	6,640	34	610	2,440	9	71
2-----	8,170	19	419	6,430	28	486	2,700	6	45
3-----	7,600	20	405	6,430	21	355	2,690	4	29
4-----	6,850	19	351	5,010	17	257	2,450	4	26
5-----	6,430	12	208	5,610	18	273	2,290	5	31
6-----	6,010	14	227	5,410	19	278	2,140	4	23
7-----	8,630	77	1,790	6,220	25	420	2,610	6	56
8-----	8,870	98	1,390	7,200	21	413	3,120	17	143
9-----	8,630	34	702	7,720	27	553	2,780	9	68
10-----	9,110	23	556	7,940	39	836	3,000	9	73
11-----	8,630	20	466	7,060	27	515	2,800	12	91
12-----	7,200	16	314	5,810	19	298	2,600	6	36
13-----	9,350	40	1,010	5,410	14	204	2,800		
14-----	9,350	70	1,770	5,010	14	189	2,700		
15-----	8,630	35	816	4,350	12	141	2,400	6	39
16-----	8,630	23	536	4,260	9	104	1,980	4	21
17-----	8,400	16	363	4,260	9	104	2,530	4	27
18-----	7,500	12	243	4,080	12	132	5,610	198	3,000
19-----	7,500	13	253	4,170	10	113	4,820	65	846
20-----	6,640	11	197	7,500	86	1,740	5,010	53	717
21-----	7,060	9	172	10,400	159	4,750	3,720	32	321
22-----	6,640	9	151	9,350	84	2,120	3,200	12	104
23-----	6,430	8	139	7,720	45	938	3,540	18	172
24-----	6,220	12	202	5,610	30	454	2,530	22	150
25-----	5,610	11	157	5,210	21	295	2,610	15	106
26-----	6,010	11	178	4,630	19	238	2,210	12	72
27-----	5,810	15	235	4,170	15	169	2,060	7	39
28-----	6,010	12	185	3,720	9	90	2,940	35	278
29-----	5,810	9	141	3,370	10	91	2,140	12	69
30-----	5,810	11	173	3,200	7	60	2,210	6	36
31-----	--	--	--	3,120	9	76	--	--	--
Total--	222,630	--	14,293	177,900	--	17,332	87,210	--	6,761
Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,840	4	20	1,050	3	9	650	2	3
2-----	2,060	8	44	1,140	12	12	635		
3-----	2,290	7	43	1,540	10	42	642		
4-----	2,370	4	26	1,240	9	30	612	4	9
5-----	1,910	4	21	2,060	55	832	612		
6-----	2,290	7	43	1,540	27	112	742		
7-----	4,080	37	408	1,530	10	41	836	19	66
8-----	3,290	24	213	1,460	4	816	916		
9-----	2,860	13	100	1,690	7	32	1,280		
10-----	2,500	12	81	1,610	16	70	1,180	10	32
11-----	2,000	4	22	1,690	9	41	1,000	6	16
12-----	1,800	3	15	1,170	4	13	958	7	18
13-----	1,700	6	28	1,180	4	13	968	7	18
14-----	1,560	7	29	1,120	4	12	1,320	10	36
15-----	1,570	6	25	1,010	4	10	926	8	20
16-----	1,480	4	16	1,010			810	8	17
17-----	1,290	4	14	905			742	5	10
18-----	1,390	2	7	905	4	9	793		
19-----	1,100			925			742		
20-----	1,190			629			759	4	8
21-----	1,570	2	7	848			759		
22-----	1,220			886			776		
23-----	847			905	2	4	759	4	8
24-----	1,140	4	12	886			750		
25-----	1,240			702			688		
26-----	1,200	4	10	725	4	8	742	4	8
27-----	1,040			734			742		
28-----	1,060			680			702		
29-----	947	4	10	658	4	8	710	--	--
30-----	867			702			710		
31-----	886			718			--		
Total--	52,667	--	1,260	34,099	--	892	24,563	--	363
Total discharge for year (cfs-days)									1,906,620
Total load for year (tons)									603,951

a Load computed by subdividing day.

b Computed from estimated concentration graph.

Source: Schroeder &amp; Kapustka (1957)

JAMES RIVER BASIN--Continued  
JAMES RIVER AT SCOTTSVILLE, VA.--Continued

EXTREMES, 1953-54.--Sediment concentrations: Maximum daily, 1,261 ppm Mar. 2; minimum daily, 1 ppm Sept. 2, 8.  
Sediment loads: Maximum daily, 170,000 tons Mar. 2; minimum daily, 2 tons Sept. 2, 8.

Suspended sediment, water year October 1953 to September 1954

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	718	4	8	1,090	14	41	905	8	20
2-----	695			1,090	9	24	896	7	17
3-----	702			1,030			1,020	9	25
4-----	665			876			876	8	19
5-----	605	3	5	876	7	16	936	8	20
6-----	665			810			1,060	10	29
7-----	598			838			3,420	130	1,200
8-----	710			905			3,120	144	1,210
9-----	688	4	7	829	8	17	2,210	38	227
10-----	642			838			3,660	58	573
11-----	688			725			3,990	85	916
12-----	688			802	9	20	3,200	40	346
13-----	688	4	7	793			5,010	78	1,060
14-----	688			848			10,100	355	9,680
15-----	582			838			9,600	313	8,110
16-----	530	4	7	838	8	18	6,640	101	1,810
17-----	590			867			6,010	44	714
18-----	658			848			4,080	24	264
19-----	688			838	8	18	3,030	15	123
20-----	688	5	9	793	8	17	2,370	9	58
21-----	688			802	8	17	2,140	8	46
22-----	672			958	9	23	2,210	9	54
23-----	688			1,010	9	25	2,060	8	44
24-----	680	6	11	1,220	9	30	2,060	8	44
25-----	695			1,190	11	35	1,760	8	38
26-----	680			1,250	12	40	1,560	8	34
27-----	734			1,200	8	26	1,440	8	31
28-----	1,020	21	50	1,020	7	19	1,560	7	29
29-----	2,060	46	256	1,030	8	22	1,360	6	22
30-----	2,450	63	417	867	8	19	1,420	7	27
31-----	1,560	32	135	--	--	--	1,440	12	47
Total-	25,103	--	1,071	27,919	--	650	91,133	--	26,637
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,360	14	51	3,990	12	129	9,420	373	9,490
2-----	1,290	13	45	3,630	12	118	43,900	1,261	170,000
3-----	1,300	11	39	3,280	9	80	44,800	734	88,600
4-----	1,320	11	39	3,030	9	74	18,900	299	15,300
5-----	1,220	12	40	2,780	9	68	13,000	116	4,070
6-----	1,310	13	46	2,610	8	56	10,100	39	1,060
7-----	1,220	13	43	2,370	9	58	8,400	30	680
8-----	1,200	14	45	2,290	8	49	7,060	24	457
9-----	1,170	10	32	2,210	8	48	6,010	22	357
10-----	1,120	10	30	1,980	9	48	5,610	22	333
11-----	1,360	12	44	2,140	9	52	5,010	19	257
12-----	2,140	16	92	1,910	9	46	4,630	19	238
13-----	1,690	19	87	1,840	7	35	4,260	43	495
14-----	1,340	16	858	1,620	8	35	4,720	35	446
15-----	1,620	12	52	1,690	9	41	6,850	42	777
16-----	3,280	23	204	1,690	8	37	7,720	25	521
17-----	6,850	87	1,610	1,690	9	41	7,720	24	500
18-----	6,640	94	1,690	1,840	11	55	6,640	19	341
19-----	7,720	71	1,480	1,690	17	78	5,410	23	356
20-----	5,410	38	555	1,760	15	71	7,280	26	511
21-----	3,810	37	381	2,290	28	173	11,200	75	2,270
22-----	4,540	39	478	13,000	352	12,400	13,300	82	2,940
23-----	8,400	149	3,380	15,700	268	11,400	9,850	44	1,170
24-----	11,200	143	4,320	10,400	141	3,960	8,170	32	706
25-----	9,350	80	2,020	7,940	66	1,410	7,060	25	477
26-----	7,940	53	1,140	6,220	45	756	6,430	20	347
27-----	7,500	49	992	5,010	31	419	5,810	21	329
28-----	7,060	38	724	4,630	28	350	6,220	19	319
29-----	6,850	28	518	--	--	--	6,850	20	370
30-----	5,410	23	336	--	--	--	6,430	19	330
31-----	5,010	14	189	--	--	--	5,610	23	348
Total-	127,630	--	20,760	111,230	--	32,087	314,370	--	304,575

\* Computed by subdividing day.

\* Computed from estimated concentration graph.

Source: Schroeder & Kapustka (1957)

JAMES RIVER BASIN--Continued  
JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Suspended sediment, water year October 1953 to September 1954--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	5,210	23	324	4,030	26	a286	3,460	8	a75
2-----	5,010	19	257	3,460	24	a224	3,030	7	a57
3-----	4,820	15	195	3,370	24	a218	2,860	5	a39
4-----	5,010	15	203	4,720	22	a260	2,450	3	a20
5-----	4,820	12	156	4,170	21	a236	2,370	3	a19
6-----	4,720	14	178	3,720	19	a191	2,210	4	a74
7-----	4,260	15	173	3,450	18	a169	2,200	4	a75
8-----	4,720	16	204	3,200	16	a134	1,620	4	a17
9-----	6,010	24	389	3,120	15	a126	1,980	4	a21
10-----	7,060	24	457	2,780	14	a105	2,140	4	a23
11-----	6,010	21	341	2,940	12	a95	2,060	4	a22
12-----	5,210	19	267	2,690	11	a80	2,210	4	a24
13-----	4,630	16	200	2,370	10	a64	1,760	4	a19
14-----	4,350	16	188	2,690	7	51	1,910	4	a21
15-----	3,990	17	183	3,200	8	69	2,690	8	a58
16-----	4,350	31	364	4,090	50	a551	3,900	23	a242
17-----	6,430	54	937	6,010	78	a1,270	3,030	28	a229
18-----	6,430	60	1,040	5,810	50	a784	3,540	25	a239
19-----	9,110	66	1,620	5,210	24	a338	3,280	24	a213
20-----	7,940	39	836	5,810	39	612	3,030	22	a180
21-----	7,060	33	629	9,600	74	1,920	2,940	20	a159
22-----	5,410	25	365	8,400	42	953	2,610	19	a134
23-----	6,220	17	285	6,640	20	359	2,450	18	a119
24-----	4,630	24	300	5,410	18	263	1,980	18	a96
25-----	4,440	38	456	5,010	12	162	1,480	17	a68
26-----	5,410	45	657	4,170	9	101	1,180	16	a51
27-----	6,850	48	808	3,630	10	90	1,230	16	a53
28-----	5,410	33	482	3,460	10	a93	1,230	16	a53
29-----	4,630	43	538	4,170	10	a113	1,190	17	a55
30-----	4,260	32	a366	5,010	11	a149	1,170	17	a54
31-----	--	--	--	4,260	10	a115	--	--	--
Total-	164,410	--	13,480	136,650	--	10,212	69,280	--	2,409
Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,370	18	a57	1,120	4	12	759	2	4
2-----	1,450	18	a70	926	5	13	802	1	2
3-----	1,200	20	a65	989	5	13	802	2	4
4-----	1,590	21	a90	1,440	8	31	759	2	4
5-----	1,440	23	a89	1,310	8	28	710		
6-----	1,280	19	66	1,140	5	15	658	5	9
7-----	1,190	14	43	1,000	6	16	672		
8-----	1,310	15	53	1,260	6	20	568	1	2
9-----	1,760	18	86	1,010	4	11	575	3	5
10-----	1,240	17	57	887	3	7	582	3	5
11-----	1,450	9	35	858	5	12	504	2	3
12-----	1,030	7	19	857	3	7	498		
13-----	848	4	9	783	2	4	498	2	3
14-----	1,390	2	8	810	3	7	480		
15-----	857	4	9	695	2	a4	498	2	3
16-----	1,360	8	29	742	2	4	474	2	3
17-----	2,460	17	113	598	4	6	492	4	5
18-----	5,210	98	1,380	650	5	9	510	4	6
19-----	2,940	25	198	926	8	20	510	4	6
20-----	2,530	9	61	1,190	6	19	510	4	a6
21-----	4,080	21	231	848	7	16	562	3	5
22-----	3,990	44	474	978	7	18	688	4	7
23-----	3,280	33	292	936	10	25	768	14	29
24-----	4,260	32	368	947	8	20	947	10	26
25-----	3,810	50	514	1,120	5	15	896	9	22
26-----	2,290	21	130	829	5	a11	759	6	12
27-----	2,140	17	98	848	6	a14	718	3	6
28-----	1,690	9	41	896	7	a17	695	2	4
29-----	1,250	6	20	1,290	8	a28	605	3	5
30-----	1,000	4	11	1,690	7	a32	605	3	5
31-----	1,010	4	11	1,350	5	18	--	--	--
Total-	62,715	--	4,739	30,933	--	472	19,104	--	205
Total discharge for year (cfs-days)-----									
Total load for year (tons)-----									
									1,180,477
									417,497

a Computed from estimated concentration graph.

Source: Schroeder & Kapustka (1957)

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

EXTR-V-5, 1954-55.--Sediment concentrations: Maximum daily, 1,294 ppm Oct. 14; minimum daily, 2 ppm on several days.  
Sediment loads: Maximum daily, 161,360 tons Nov. 7; minimum daily, 5 tons on several days.

Suspended sediment, water year October 1954 to September 1955

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	582	3	5	2,210	15	90	4,260	15	173
2-----	575	2	3	2,290	12	74	4,630	13	163
3-----	575	2	3	2,860	23	178	4,440	11	132
4-----	562	2	3	2,780	25	168	3,900	10	105
5-----	562	2	3	2,370	12	77	3,540	9	86
6-----	759	3	6	1,760	9	43	3,280	10	489
7-----	642	4	7	2,140	11	64	3,810	12	123
8-----	605	4	7	1,810	8	41	4,080	12	132
9-----	542	3	4	2,140	7	40	3,900	12	126
10-----	542	3	4	1,690	7	32	4,640	24	294
11-----	516	3	4	1,760	10	48	5,810	23	361
12-----	504	2	3	1,840	8	40	6,840	19	341
13-----	510	2	3	1,760	11	52	5,610	16	227
14-----	516	3	4	1,760	9	43	8,890	136	2,260
15-----	920	93	231	1,400	8	30	9,350	118	2,980
16-----	31,600	1,294	111,000	1,760	7	33	9,110	43	1,060
17-----	39,600	752	80,400	1,480	9	36	9,110	21	577
18-----	13,400	332	12,000	1,840	10	50	8,400	15	4340
19-----	7,280	191	3,760	2,860	73	564	7,940	16	343
20-----	5,010	124	1,680	8,690	266	6,710	8,400	14	318
21-----	3,720	91	4914	24,300	290	19,000	9,110	15	369
22-----	2,860	36	278	27,200	274	20,100	7,720	12	250
23-----	2,530	26	178	16,700	130	5,860	6,220	13	218
24-----	2,290	15	93	10,400	57	1,600	5,410	13	180
25-----	2,140	11	64	8,170	27	566	5,010	12	162
26-----	1,840	11	55	6,430	19	330	4,540	7	86
27-----	1,760	8	38	5,210	13	183	4,170	7	79
28-----	1,690	11	50	4,720	11	140	3,900	6	63
29-----	1,760	11	52	4,440	10	120	4,820	47	61
30-----	2,060	19	106	4,630	12	1150	12,800	345	11,900
31-----	2,290	31	192	--	--	--	35,500	307	29,400
Total-	130,742	--	211,140	159,500	--	56,512	218,840	--	53,948

## JAMES RIVER BASIN--Continued

## JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Suspended sediment, water year October 1954 to September 1955--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	6,540	19	341	4,280	23	265	2,700	25	182
2-----	8,640	15	269	3,990	19	205	2,100	25	142
3-----	5,810	15	235	3,630	16	157	1,670	26	117
4-----	5,610	15	227	3,720	20	201	1,660	11	49
5-----	5,210	13	183	3,460	22	206	1,810	7	34
6-----	4,540	15	184	3,460	18	168	1,490	6	32
7-----	4,540	15	184	3,370	16	146	1,640	6	27
8-----	4,440	13	156	3,030	10	82	1,950	15	79
9-----	4,080	10	110	2,860	9	69	3,370	60	546
10-----	3,810	8	82	2,780	9	68	3,030	46	376
11-----	3,540	21	201	2,780	9	68	4,090	235	2,600
12-----	5,810	57	694	2,620	10	71	11,200	486	14,700
13-----	7,280	72	1,420	2,780	13	98	6,850	214	3,960
14-----	7,760	149	3,120	3,200	16	138	6,640	107	1,920
15-----	17,800	274	13,200	3,200	20	173	4,620	62	807
16-----	20,000	168	9,070	3,200	18	156	3,720	39	392
17-----	15,300	90	3,720	3,370	20	182	3,120	29	244
18-----	12,100	60	1,960	3,810	22	226	2,550	19	131
19-----	10,400	44	1,240	3,370	14	127	2,620	14	69
20-----	8,870	34	814	3,030	11	90	2,320	11	69
21-----	8,170	41	904	2,480	11	74	2,320	14	88
22-----	7,400	49	979	2,780	12	90	2,020	13	71
23-----	6,900	36	671	3,030	10	82	2,020	8	44
24-----	6,430	31	538	3,120	20	168	1,950	8	42
25-----	6,220	31	521	3,200	16	138	1,950	10	53
26-----	6,220	38	638	3,120	10	84	2,020	9	49
27-----	5,010	41	555	2,700	9	66	2,100	11	62
28-----	5,210	36	506	2,550	5	34	1,710	8	37
29-----	4,820	24	312	2,250	6	36	1,710	7	32
30-----	4,540	21	257	4,540	39	478	1,670	6	27
31-----	--	--	--	3,200	38	328	--	--	--
Total-	221,100	--	43,491	98,890	--	4,474	88,820	--	27,011
July			August			September			
1-----	1,440	5	19	1,400	9	34	2,400	9	58
2-----	1,360	3	11	1,400	6	23	1,950	67	353
3-----	1,370	2	7	1,270	5	17	2,550	12	83
4-----	1,180	3	10	1,110	3	9	4,350	46	540
5-----	1,230	2	7	992	4	11	3,200	40	346
6-----	1,250	2	7	1,090	9	26	3,030	18	147
7-----	1,410	2	8	1,030	10	28	2,620	12	85
8-----	1,620	5	22	1,180	7	22	2,780	10	75
9-----	1,630	27	119	1,100	6	18	2,400	7	45
10-----	1,810	6	29	2,610	47	331	1,880	7	36
11-----	2,480	42	281	2,180	47	277	2,100	11	62
12-----	2,480	58	388	1,950	31	163	1,670	6	27
13-----	2,700	104	758	3,810	82	844	1,450	3	12
14-----	2,620	35	248	4,170	175	1,970	1,600	4	17
15-----	1,740	11	52	6,010	233	3,780	1,670	4	18
16-----	1,750	9	43	4,170	97	1,090	1,550	5	21
17-----	1,350	6	22	6,080	240	6,610	1,490	5	20
18-----	1,300	4	14	51,800	720	101,000	1,580	4	17
19-----	1,310	3	11	28,800	318	24,700	1,400	4	15
20-----	1,160	3	9	16,400	196	8,680	1,180	3	10
21-----	840	3	7	5,850	115	3,060	1,340	4	14
22-----	830	3	7	7,060	56	1,070	1,280	5	17
23-----	1,000	31	84	5,210	48	675	1,190	4	13
24-----	1,020	9	25	4,350	29	341	1,270	5	17
25-----	1,180	8	25	3,540	16	153	1,330	4	14
26-----	1,230	10	33	3,200	14	121	1,130	4	12
27-----	1,180	6	19	2,780	12	90	1,230	4	13
28-----	1,150	5	16	2,320	8	50	1,440	6	23
29-----	1,180	5	16	2,320	6	38	1,310	5	18
30-----	1,180	7	22	2,250	8	49	1,240	5	17
31-----	1,280	8	28	1,740	7	33	--	--	--
Total-	45,260	--	2,347	183,172	--	155,313	55,610	--	2,145
Total discharge for year (cfs-days)-----									2,189,394
Total load for year (tons)-----									1,090,514

\* Computed by subdividing day.

a Computed from estimated concentration graph.

Source: Kapustka (1957)

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

JAMES RIVER BASIN--Continued

JAMES RIVER AT SCOTTSVILLE, VA.--Continued

1955-56.--Sediment concentrations: Maximum daily, 417 ppm Sept. 28; minimum daily, 1 ppm June 13, July 4.  
Sediment loads: Maximum daily, 9,640 tons Mar. 16; minimum daily, 2 tons July 4.

Suspended sediment, water year October 1955 to September 1956

Day	October			November			December		
	Mean dis-charge (cfs)	Mean concentration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concentration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concentration (ppm)	Tons per day
1.....	1,240	4	13	1,030	11	31	1,020	12	33
2.....	1,240	4	13	1,020	9	25	992	11	29
3.....	1,110	4	12	1,020	9	25	1,100	12	36
4.....	1,210			981	10	26	1,230	14	46
5.....	1,300			1,020	14	39	1,150	12	37
6.....	1,180	3	9	1,000	13	35	1,180	13	41
7.....	935			1,110	14	42	1,110	15	45
8.....	935			1,130	13	40	1,170	16	51
9.....	1,050			1,100	11	33	1,130	15	46
10.....	1,290	4	13	1,130	12	37	1,250	17	57
11.....	1,210			1,270	17	58	1,350	15	55
12.....	1,360			1,450	17	67	1,280	14	a48
13.....	1,290			1,370	15	55	1,120	14	a42
14.....	1,220	3	a10	1,350	13	47	1,150	15	a47
15.....	1,150			1,340	10	36	1,210	14	a46
16.....	1,130	3	9	1,330	10	36	1,160	13	41
17.....	1,070			1,270	13	45	1,230	13	43
18.....	1,000	6	18	1,190	14	a45	1,190	14	a45
19.....	1,190			1,270	13	45	1,090	15	44
20.....	1,120			1,310	13	46	1,060	15	43
21.....	1,030	7	a19	1,420	17	65	1,050	16	46
22.....	1,100	10	30	1,440	14	54	1,870	24	121
23.....	1,110	5	15	1,210	10	33	1,750	17	80
24.....	992	5	13	1,190	10	32	1,300	17	60
25.....	958	9	23	1,160	12	38	1,100	17	a50
26.....	1,000	17	46	1,190	10	32	1,090	16	a47
27.....	992	12	32	1,220	12	40	1,030	15	42
28.....	981	9	24	1,160	12	38	970	15	39
29.....	992	11	29	1,190	12	39	904	16	a39
30.....	1,070	12	35	1,170	12	39	1,100	16	48
31.....	1,000	10	27	--	--	--	1,120	14	42
Total	34,455	--	532	36,041	--	1,222	36,466	--	1,489
Day	January			February			March		
	Mean dis-charge (cfs)	Mean concentration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concentration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concentration (ppm)	Tons per day
1.....	1,030	17	47	1,170	24	76	4,720	12	a153
2.....	1,060	16	46	1,640	40	177	4,280	13	150
3.....	1,040	16	45	3,760	78	585	3,090	13	140
4.....	958	16	41	3,280	67	593	3,630	13	127
5.....	946	16	41	6,220	220	a3,960	3,370	13	118
6.....	1,030	15	42	10,400	221	6,210	3,200	12	104
7.....	1,000	16	43	12,100	169	5,520	3,030	11	90
8.....	1,070	16	46	14,000	152	5,750	2,780	11	83
9.....	1,050	17	48	12,700	105	a3,600	3,200	19	164
10.....	1,040	18	51	8,400	60	1,360	4,820	27	351
11.....	1,100	16	45	7,260	37	727	5,810	21	329
12.....	1,040	15	a42	3,900	34	358	4,720	17	217
13.....	958	16	41	5,010	28	379	4,440	17	a204
14.....	914	13	32	4,350	18	211	4,260	18	207
15.....	914	13	32	3,900	12	126	6,220	53	a1,010
16.....	882	15	36	3,370	11	100	18,500	193	9,640
17.....	924	13	32	3,360	11	103	15,300	135	5,580
18.....	935	15	38	3,720	17	171	12,400	85	2,850
19.....	914	14	35	4,540	24	294	10,900	41	1,210
20.....	992	16	43	7,280	29	570	9,600	22	570
21.....	981	17	45	7,500	29	a587	8,870	17	407
22.....	970	21	55	7,060	25	477	7,940	16	343
23.....	1,000	14	38	5,610	27	409	6,640	21	376
24.....	1,030	13	36	5,010	18	243	3,810	20	206
25.....	1,020	14	39	3,900	16	163	3,810	19	195
26.....	946	13	33	4,080	17	187	4,630	16	200
27.....	992	16	a43	4,080	15	176	4,540	12	147
28.....	1,070	17	49	5,010	18	243	4,170	11	124
29.....	1,030	13	a36	5,610	14	212	4,080	11	a121
30.....	1,190	12	39	--	--	--	3,540	11	105
31.....	1,050	18	51	--	--	--	3,630	11	109
Total	31,076	--	1,290	167,360	--	33,572	134,810	--	25,629

s Computed by subdividing day.

a Computed from estimated concentration graph.

REPRODUCIBILITY OF THE  
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JAMES RIVER BASIN--Continued  
JAMES RIVER AT SCOTTSVILLE, VA.--Continued

Suspended sediment, water year October 1955 to September 1956--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1....	3,400	11	103	3,200	16	139	1,460	2	9
2....	3,200	10	88	3,120	21	177	1,890	9	46
3....	3,700	11	97	2,860	21	2162	2,100	16	91
4....	3,120	11	93	3,120	17	143	1,950	13	66
5....	2,940	11	87	2,940	16	127	1,810	7	34
6....	3,030	16	131	3,030	17	139	2,400	36	233
7....	4,630	25	313	3,120	18	152	2,700	18	131
8....	5,210	37	520	3,370	24	218	2,320	5	31
9....	8,870	64	1,530	3,200	30	259	2,020	3	16
10....	9,600	47	1,220	2,860	18	139	1,660	4	18
11....	7,940	31	665	2,700	13	95	1,440	5	19
12....	7,940	29	622	2,400	13	84	1,670	5	23
13....	5,410	21	307	2,400	12	78	1,340	1	4
14....	5,810	18	282	2,320	11	69	1,280	2	27
15....	5,010	26	352	2,250	12	73	1,310	4	14
16....	9,220	114	3,120	2,320	10	63	1,290	2	7
17....	14,600	232	39,590	1,780	11	53	1,340	3	11
18....	18,100	159	7,770	2,180	9	53	1,230	7	23
19....	12,400	85	2,850	2,100	10	57	1,730	18	84
20....	9,350	49	1,240	1,880	11	256	1,750	28	132
21....	8,170	27	596	1,800	6	29	1,840	31	157
22....	7,280	27	531	1,880	5	25	2,400	28	101
23....	4,350	25	294	1,730	5	23	1,750	17	60
24....	4,630	21	263	1,420	4	215	1,670	13	59
25....	4,540	20	245	1,240	3	10	1,490	10	40
26....	4,050	16	176	1,290	4	14	1,430	9	236
27....	3,810	16	165	1,310	4	16	1,390	6	23
28....	3,630	16	157	1,490	6	24	1,350	3	11
29....	3,370	11	100	1,500	3	12	1,290	3	10
30....	3,120	12	101	1,500	4	16	1,110	3	9
31....	--	--	--	1,600	4	217	--	--	--
Total	190,100	--	33,606	70,110	--	2,535	50,590	--	1,567
Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1....	1,050	4	11	1,230	13	43	684	4	7
2....	1,030	6	17	1,180	11	35	754	4	6
3....	692	4	7	1,220	10	33	620	3	5
4....	744	1	2	1,490	7	28	667	5	9
5....	1,710	4	18	1,220	14	46	590		
6....	1,160	4	13	1,220	10	33	667	9	20
7....	1,030	11	31	992	6	16	1,020		
8....	1,000	10	27	1,000	9	24	1,020		
9....	1,680	15	276	1,250	7	24	782		
10....	1,390	27	101	1,350	6	22	744	5	10
11....	1,490	17	258	1,230	5	17	735		
12....	1,090	5	215	1,040	6	17	684		
13....	1,110	3	9	1,030	5	14	718		
14....	1,030	3	8	872			692	3	5
15....	914	5	12	692	4	8	667		
16....	820	4	9	710			620		
17....	792	4	9	710			523		
18....	802	6	13	735	4	8	504	2	3
19....	820	4	9	658			498		
20....	754	3	6	735	4	8	462		
21....	5,120	311	24,930	904	4	10	468		
22....	2,400	107	693	862	4	29	468	4	5
23....	1,570	54	243	914	4	210	498		
24....	1,750	46	217	710	4	28	582		
25....	2,020	41	224	754	4	28	575	9	214
26....	1,950	32	168	701	4	28	549	11	216
27....	1,500	19	77	635	4	27	2,700	116	2,040
28....	1,280	13	45	605			6,850	417	7,710
29....	1,290	12	42	590	4	7	4,540	148	1,810
30....	1,290	15	52	620			3,370	60	546
31....	1,210	16	52	735			--	--	--
Total	42,788	--	7,204	28,594	--	496	34,251	--	12,337
Total discharge for year (cfs-days)-----									
Total load for year (tons)-----									
									905,741
									121,520
a Computed by subdividing day.									
b Computed from estimated concentration graph.									



APPENDIX I  
AIR EFFLUENTS  
SOURCES & AMOUNTS

## APPENDIX I

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SHIPPING TONNAGE AND NO. OF VESSELS\*

TOTAL ANNUAL TONNAGE

<u>Year</u>	<u>Hampton Roads</u>	<u>James River</u>
1955	56,545,914	5,196,604
1960	49,955,853	5,186,222
1965	54,105,576	5,103,453
1970	71,490,386	7,301,413

SPECIFIC COMMODITY TONNAGE

<u>Year</u>	<u>Hampton Roads Coal</u>	<u>James River Sand/Gravel</u>
1955	19,162,410	2,636,329
1960	28,643,523	2,091,943
1965	38,766,919	3,351,487
1970	33,780,358	3,813,678

<u>Year</u>	<u>Petroleum Products Hampton Roads</u>	<u>James River</u>
1955	13,310,752	2,107,069
1960	13,066,038	2,493,670
1965	6,320,545	1,044,454
1970	11,425,339	2,039,283

<u>Year</u>	<u>No. of Vessels Hampton Roads</u>	<u>James River</u>
1955	89,606	52,324
1960	113,578	120,941
1965	66,521	108,964
1970	73,991	56,333

\*Waterborne Commerce of the U.S., Part 1, Waterways and Harbors, Atlantic Coast, Department of the Army, Corps of Engineers, for calendar years '55, '60, '65, '70.

AIR TRANSPORTATION  
Number of Flights per Year (X.100)

		Number of Engines			
		1	2	3	4
Byrd Field Richmond (5)					
	Turbojet	-	177	-	-
	Turbofan				
	Med Range	-	33	29	-
	Turboprop	-	53	-	-
	Piston				
	Light	36	24	-	-
	Transport	-	3	-	5
Langley NASA (6)					
	Turbofan				
	Medium Range	-	133	-	-
	Turboprop	-	-	-	221
Ft. Eustis AP (6)					
	Turboprop	867	867	-	-
	Piston				
	Transport	-	-	-	698
Patrick Henry (6)					
	Turbojet	-	3	-	-
	Turbofan				
	Medium Range	-	-	499	-
	Turboprop	-	26	-	-
	Piston				
	Light	520	347	-	-
	Transport	-	66	-	152
Norfolk Regional (6)					
	Turbojet	-	45	-	-
	Turbofan				
	Medium Range	-	15	147	-
	Turboprop	-	41	-	-
	Piston				
	Light	276	184	-	-
	Transport	-	34	-	80

Source: Virginia Air Pollution Control Board  
( ) indicates Air Pollution Control Board region numbers

VEPCO POWER CONSUMPTION CATEGORIES:  
KEY TO FOLLOWING TABLE

440.0	Residential Sales
442.1	Commercial Sales
442.2	Industrial Sales
444.1	Public Street Lighting
444.2	Highway Lighting
445.0	Other Sales to Public Authority
447.0	Sale for Resale

VIRGINIA ELECTRIC AND POWER COMPANY  
KILOWATT HOURS (IN THOUSANDS)  
MAY 1971

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL May 1971	TOTAL May 1970	INCREASE
<b>OPERATING REVENUE ACCOUNTS</b>										
CENTRAL DIVISION-VA.										
Richmond District	93 938	82 916	48 785	177	203	28 884		254 903	251 449	3 454
Petersburg District	26 594	10 953	83 320	368	27	9 827	385	137 534	135 496	2 038
Total Central Division-VA.	120 532	93 869	138 155	545	230	38 711	385	392 437	386 935	5 502
<b>EASTERN DIVISION</b>										
Norfolk District-VA.	113 950	75 362	60 861	2 876	264	70 584	3 444	327 341	311 657	15 684
Norfolk District-N.C.	269	25				7		402	265	137
Total Norfolk District	114 319	75 388	60 861	2 876	264	70 591	3 444	327 743	311 922	15 821
Peninsula District-VA.	52 444	34 743	35 800	1 232	115	51 991		176 329	169 719	6 550
Total Eastern Division	166 763	110 136	96 669	4 098	380	122 582	3 444	504 072	481 701	22 371

VIRGINIA ELECTRIC AND POWER COMPANY  
KILOWATT HOURS (IN THOUSANDS)  
APRIL 1971

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL April 1971	TOTAL April 1970	INCREASE
<b>OPERATING REVENUE ACCOUNTS</b>										
CENTRAL DIVISION-VA.										
Richmond District	108,369	77,807	48,007	168	216	34,391		268,958	235,216	33,742
Petersburg District	29,595	11,410	85,028	366	27	10,333	438	137,197	137,979	4,218
Total Central Division-VA.	137,964	89,217	133,035	534	243	44,724	438	406,155	368,195	37,960
<b>EASTERN DIVISION</b>										
Norfolk District-VA.	129,535	76,861	60,509	2,892	281	74,693	4,038	348,809	318,974	29,835
Norfolk District-N.C.	17							17	12	5
Total Norfolk District	129,552	76,861	60,509	2,892	281	74,693	4,038	348,826	318,986	29,840
Peninsula District-VA.	59,209	35,418	36,344	1,211	110	50,663		182,965	177,492	5,493
Total Eastern Division	188,761	112,279	96,853	4,103	391	125,356	4,038	531,811	496,478	35,333

VIRGINIA ELECTRIC AND POWER COMPANY  
KILOWATT HOURS (IN THOUSANDS)  
MARCH 1971

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL March '71	TOTAL March '70	INCREASE
<b>OPERATING REVENUE ACCOUNTS</b>										
CENTRAL DIVISION-VA.										
Richmond District	119 972	79 872	45 628	168	185	31 703		277 528	271 413	6 115
Petersburg District	35 266	11 568	80 745	365	27	10 889	386	139 246	135 501	3 745
Total Central Division-VA.	155 238	91 440	126 373	533	212	42 592	386	416 774	406 914	9 860
<b>EASTERN DIVISION</b>										
Norfolk District-VA.	142 471	78 072	52 800	2 822	261	79 286	3 758	359 470	350 943	8 527
Norfolk District-N.C.	391	27				7		425	291	134
Total Norfolk District	142 862	78 099	52 800	2 822	261	79 293	3 758	359 895	351 234	8 661
Peninsula District-VA.	65 749	32 468	35 515	1 259	109	57 632		192 702	180 670	12 032
Total Eastern Division	208 611	110 567	88 315	4 081	370	136 925	3 758	552 597	531 904	20 693

VIRGINIA ELECTRIC AND POWER COMPANY  
KILOWATT HOURS (IN THOUSANDS)  
FEBRUARY 1971

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL Feb. 1971	TOTAL Feb. 1970	INCREASE
<b>OPERATING REVENUE ACCOUNTS</b>										
CENTRAL DIVISION-VA.										
Richmond District	135 608	87 001	48 908	157	182	33 540		305 486	258 939	46 547
Petersburg District	38 219	12 136	84 377	366	27	11 691	458	147 204	137 808	9 396
Total Central Division-VA.	173 827	99 137	133 305	523	209	45 231	458	452 690	396 747	55 943
<b>EASTERN DIVISION</b>										
Norfolk District-VA.	161 275	81 121	54 385	2 808	260	79 201	4 766	383 816	347 068	36 748
Norfolk District-N.C.	11	(99)						(68)	16	(104)
Total Norfolk District	161 286	81 022	54 385	2 808	260	79 201	4 766	383 728	347 084	36 644
Peninsula District-VA.	75 137	37 930	34 576	1 147	109	47 621		196 520	194 281	2 239
Total Eastern Division	236 423	118 952	88 961	3 955	369	126 822	4 766	580 248	541 365	38 883

VIRGINIA ELECTRIC AND POWER COMPANY

KILOWATT HOURS (IN THOUSANDS)

JANUARY 1971

OPERATING REVENUE ACCOUNTS

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL Jan. 1971	TOTAL Jan. 1970	INCREASE
CENTRAL DIVISION-VA.										
Richmond District	131 339	84 177	44 753	156	185	33 148		293 758	288 818	4 940
Petersburg District	38 145	12 058	81 796	364	27	11 323	461	144 174	142 110	2 064
Total Central Division-VA.	169 484	96 235	126 549	520	212	44 471	461	437 932	430 928	7 004
EASTERN DIVISION										
Norfolk District-VA.	162 528	80 225	51 547	2 721	257	78 269	4 525	380 072	371 722	8 350
Norfolk District-N.C.	390	128				6		524	323	191
Total Norfolk District	162 918	80 353	51 547	2 721	257	78 275	4 525	380 596	372 055	8 541
Peninsula District-VA.	75 278	39 067	31 425	1 169	110	49 171		196 220	190 058	6 162
Total Eastern Division	238 196	119 420	82 972	3 890	367	127 446	4 525	576 816	562 113	14 703

VIRGINIA ELECTRIC AND POWER COMPANY

Kilowatt Hours (In Thousands)

December 1970

OPERATING REVENUE ACCOUNTS

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL Dec. 1970	TOTAL Dec. 1969	INCREASE
CENTRAL DIVISION-VA.										
Richmond District	94 955	79 694	49 612	150	192	29 300		253 903	235 267	18 636
Petersburg District	30 565	11 834	83 086	365	27	10 827	433	137 132	127 391	9 741
Total Central Division-VA.	125 520	91 528	132 698	515	219	40 122	433	391 035	362 658	28 377
EASTERN DIVISION										
Norfolk District-VA.	128 349	79 170	50 412	2 773	257	79 435	3 847	344 243	337 045	12 198
Norfolk District-N.C.	9	(208)						(199)	(18)	(181)
Total Norfolk District	128 358	78 962	50 412	2 773	257	79 435	3 847	344 044	337 027	12 017
Peninsula District-VA.	62 164	35 629	26 343	1 153	110	46 762		172 166	174 502	(2 336)
Total Eastern Division	190 522	114 591	76 755	3 926	367	126 197	3 847	516 210	506 529	9 681

VIRGINIA ELECTRIC AND POWER COMPANY

Kilowatt Hours (In Thousands)

November 1970

OPERATING REVENUE ACCOUNTS

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL November 1970	TOTAL November 1969	INCREASE
CENTRAL DIVISION-VA.										
Richmond District	119 939	86 935	47 708	204	188	30 934		235 903	219 041	26 862
Petersburg District	27 637	13 404	86 932	361	28	10 150	436	138 948	128 944	10 004
Total Central Division-VA.	147 576	100 339	134 640	565	216	41 084	436	424 856	377 985	46 871
EASTERN DIVISION										
Norfolk District-VA.	123 912	83 108	51 392	2 765	257	71 710	3 853	336 997	305 149	31 848
Norfolk District-N.C.	283	236				7		526	232	294
Total Norfolk District	124 195	83 344	51 392	2 765	257	71 717	3 853	337 523	305 381	32 142
Peninsula District-VA.	53 743	26 605	31 280	1 167	106	45 309		168 210	164 973	3 237
Total Eastern Division	177 938	110 949	82 672	3 932	363	117 026	3 853	505 733	470 354	35 379

VIRGINIA ELECTRIC AND POWER COMPANY

Kilowatt Hours (In Thousands)

October 1970

OPERATING REVENUE ACCOUNTS

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL Oct. 1970	TOTAL Oct. 1969	INCREASE
CENTRAL DIVISION-VA.										
Richmond District	100 889	97 030	53 774	108	179	28 987		280 957	233 300	47 657
Petersburg District	29 593	14 056	84 361	364	28	10 181	431	139 014	126 684	12 330
Total Central Division-VA.	130 482	111 086	138 135	472	207	39 168	431	419 981	359 984	59 997
EASTERN DIVISION										
Norfolk District-VA.	147 199	101 921	54 587	2 725	257	73 750	4 183	384 622	322 075	62 547
Norfolk District-N.C.	63	2						65	18	47
Total Norfolk District	147 262	101 923	54 587	2 725	257	73 750	4 183	384 687	322 093	62 594
Peninsula District-VA.	72 883	46 771	38 452	1 155	104	50 634		209 999	174 185	35 814
Total Eastern Division	220 145	148 694	93 039	3 880	361	124 384	4 183	594 686	496 278	98 408

VIRGINIA ELECTRIC AND POWER COMPANY  
Kilowatt Hours (In Thousands)  
September 1970

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	Sept. 1970	Sept. 1969	
CENTRAL DIVISION-VA.										
Richmond District	150 239	107 019	56 290	124	179	29 280		343 131	304 012	39 119
Petersburg District	31 219	15 420	90 366	357	28	10 121	448	147 959	136 651	11 308
Total Central Division-VA.	181 458	122 439	146 656	481	207	39 401	448	491 090	440 663	50 427
EASTERN DIVISION										
Norfolk District-VA.	176 624	110 183	51 854	2 702	256	83 522	4 732	429 873	379 280	50 593
Norfolk District-N.C.	337	49						388	379	9
Total Norfolk District	176 961	110 232	51 854	2 702	256	83 524	4 732	430 261	379 659	50 602
Peninsula District-VA.	82 154	50 598	38 843	1 150	101	52 382		225 228	196 097	29 131
Total Eastern Division	259 115	160 830	90 697	3 852	357	135 906	4 732	655 489	575 756	79 733

VIRGINIA ELECTRIC AND POWER COMPANY  
Kilowatt Hours (In Thousands)  
August 1970

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	August 1970	August 1969	
CENTRAL DIVISION-VA.										
Richmond District	101 379	100 438	57 064	133	190	26 544		235 748	273 367	12 381
Petersburg District	30 934	14 555	89 707	357	28	11 549	436	147 566	137 178	10 388
Total Central Division-VA.	132 313	114 993	146 771	490	218	38 093	436	433 314	410 545	22 769
EASTERN DIVISION										
Norfolk District-VA.	155 957	100 547	49 313	2 706	262	83 129	4 463	396 377	383 900	12 477
Norfolk District-N.C.	16	1						17	16	1
Total Norfolk District	155 973	100 548	49 313	2 706	262	83 129	4 463	396 394	383 916	12 478
Peninsula District-VA.	80 187	47 396	38 778	1 158	100	56 897		224 516	210 530	13 986
Total Eastern Division	236 160	147 944	88 091	3 864	362	140 026	4 463	620 910	594 446	26 464

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
JULY 1970

Corrected 9-2-70

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	July 1970	July 1969	
CENTRAL DIVISION-VA.										
Richmond District	124,436	99,565	50,350	111	168	28,446		303,076	289,341	13,735
Petersburg District	26,962	14,636	85,813	356	29	10,652	419	138,867	128,776	10,091
Total Central Division-VA.	151,398	114,201	136,163	467	197	39,098	419	441,943	418,117	23,826
EASTERN DIVISION										
Norfolk District-VA.	139,714	101,019	48,495	2,708	250	82,191	4,217	378,594	374,379	4,215
Norfolk District-N.C.	258	033				004		295	273	22
Total Norfolk District	139,972	101,052	48,495	2,708	250	82,195	4,217	378,889	374,652	4,237
Peninsula District-VA.	68,412	46,729	36,116	1,136	129	56,224		208,746	206,520	2,226
Total Eastern Division	208,384	147,781	84,611	3,844	379	138,419	4,217	587,635	581,172	6,463

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
JUNE 1970

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	JUNE 1970	JUNE 1969	
CENTRAL DIVISION-VA.										
Richmond District	79,936	92,479	57,583	159	194	26,348		256,699	224,489	32,210
Petersburg District	23,595	12,813	84,733	355	27	10,417	372	132,372	127,171	5,201
Total Central Division-VA.	103,531	105,292	142,316	514	221	36,765	372	389,071	351,660	37,411
EASTERN DIVISION										
Norfolk District-VA.	112,062	87,873	50,127	2,685	248	78,846	3,926	335,767	308,800	26,967
Norfolk District-N.C.	13							13	4	9
Total Norfolk District	112,075	87,873	50,127	2,685	248	78,846	3,926	335,780	308,804	26,976
Peninsula District-VA.	59,500	42,896	39,620	1,134	91	56,970		200,211	185,938	14,273
Total Eastern Division	171,575	130,769	89,747	3,819	339	135,816	3,926	535,991	494,742	41,249



VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MAY 1970

	OPERATING REVENUE ACCOUNTS							TOTAL MAY 1970	TOTAL MAY 1969	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0			
CENTRAL DIVISION-VA.										
Richmond District	101,560	79,456	43,591	131	173	26,538		251,449	231,804	19,645
Petersburg District	24,883	11,375	88,183	354	28	10,365	298	135,486	121,911	13,575
Total Central Division-VA.	126,443	90,831	131,774	485	201	36,903	298	386,935	353,715	33,220
EASTERN DIVISION										
Norfolk District-VA.	111,249	75,959	49,259	2,641	248	68,829	3,472	311,657	283,194	28,463
Norfolk District-N.C.	238	20				7		265	250	15
Total Norfolk District	111,487	75,979	49,259	2,641	248	68,836	3,472	311,922	283,444	28,478
Peninsula District-VA.	49,954	35,264	36,856	1,122	94	46,489		169,779	155,357	14,422
Total Eastern Division	161,441	111,243	86,115	3,763	342	115,325	3,472	481,701	438,801	42,900

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF APRIL 1970

	OPERATING REVENUE ACCOUNTS							TOTAL APRIL 70	TOTAL APRIL 69	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0			
CENTRAL DIVISION-VA.										
Richmond District	91,977	73,269	43,337	134	167	26,332		235,216	221,761	13,455
Petersburg District	29,148	10,629	81,548	354	27	10,516	357	132,979	127,153	5,826
Total Central Division-VA.	121,125	83,898	125,155	488	194	36,848	357	368,195	348,914	19,281
EASTERN DIVISION										
Norfolk District-VA.	120,330	72,292	49,905	2,706	246	70,023	3,472	310,974	288,748	22,226
Norfolk District-N.C.	11	1				12		12	11	1
Total Norfolk District	120,341	72,293	49,905	2,706	246	70,023	3,472	310,986	288,759	22,227
Peninsula District-VA.	60,362	33,275	34,551	1,121	95	48,088		177,492	160,895	16,597
Total Eastern Division	180,703	105,568	84,456	3,827	341	118,111	3,472	488,478	449,654	48,824

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF MARCH 1970

	OPERATING REVENUE ACCOUNTS							TOTAL MAR. 1970	TOTAL MAR. 1969	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0			
CENTRAL DIVISION-VA.										
Richmond District	126,217	73,251	43,631	138	188	27,988		271,413	264,452	6,961
Petersburg District	33,278	10,871	79,761	353	23	10,868	362	135,501	125,210	10,291
Total Central Division-VA.	159,495	84,122	123,392	491	215	38,856	362	406,914	389,662	17,252
EASTERN DIVISION										
Norfolk District-VA.	145,133	73,395	52,843	2,665	244	72,973	3,690	350,943	332,761	18,182
Norfolk District-N.C.	265	19				7		291	207	84
Total Norfolk District	145,398	73,414	52,843	2,665	244	72,980	3,690	351,234	332,968	18,266
Peninsula District-VA.	63,800	33,448	33,331	1,118	94	48,899		180,690	171,036	9,654
Total Eastern Division	209,198	106,862	86,174	3,783	338	121,879	3,690	531,924	504,104	27,820

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH FEBRUARY 1970

	OPERATING REVENUE ACCOUNTS							TOTAL FEB. 1970	TOTAL FEB. 1969	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0			
CENTRAL DIVISION-VA.										
Richmond District	111,834	73,876	44,805	152	157	28,115		258,939	237,257	21,682
Petersburg District	34,609	11,326	80,171	354	27	10,909	412	137,808	120,582	17,226
Total Central Division-VA.	146,443	85,202	124,976	506	184	39,024	412	396,747	357,839	38,908
EASTERN DIVISION										
Norfolk District-VA.	146,177	70,897	53,181	2,662	245	69,521	4,385	347,068	308,829	38,239
Norfolk District-N.C.	16							16	2	14
Total Norfolk District	146,193	70,897	53,181	2,662	245	69,521	4,385	347,084	308,831	38,253
Peninsula District-VA.	72,494	36,226	37,934	1,111	94	46,422		194,281	175,423	18,858
Total Eastern Division	218,687	107,123	91,115	3,773	339	115,943	4,385	541,365	484,254	57,111

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF JANUARY 1970

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	JAN. 1970	JAN. 1969	
CENTRAL DIVISION-VA.										
Richmond District	141,385	76,674	41,313	105	154	29,187		288,818	271,967	16,851
Petersburg District	37,287	12,347	79,817	350	28	11,889	392	142,110	126,104	16,006
Total Central Division-Va.	178,672	89,021	121,130	455	182	41,076	392	430,928	398,071	32,857
EASTERN DIVISION										
Norfolk District-Va.	158,322	76,507	53,386	2,670	253	76,154	4,430	371,722	337,161	34,561
Norfolk District-N.C.	306	21				6		333	300	33
Total Norfolk District	158,628	76,528	53,386	2,670	253	76,160	4,430	372,055	337,461	34,594
Peninsula District-Va.	72,438	35,271	37,004	1,109	93	44,143		190,058	181,686	8,372
Total Eastern Division	231,066	111,799	90,390	3,779	346	120,303	4,430	562,113	519,147	42,966

SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF DECEMBER 1969

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	DEC. 1969	DEC. 1968	
CENTRAL DIVISION-VA.										
Richmond District	92,611	73,445	43,193	126	166	25,726		235,267	215,605	19,662
Petersburg District	28,581	11,018	76,961	351	26	10,032	422	127,391	116,098	11,293
Total Central Division-Va.	121,192	84,463	120,154	477	192	35,758	422	362,658	331,703	30,955
EASTERN DIVISION										
Norfolk District-Va.	125,430	73,008	53,831	2,626	243	72,886	4,021	332,045	293,815	38,230
Norfolk District-N.C.	31	(49)						(18)	4	(22)
Total Norfolk District	125,461	72,959	53,831	2,626	243	72,886	4,021	332,027	293,819	38,208
Peninsula District-Va.	63,124	33,430	34,552	1,123	92	42,181		174,502	162,705	11,797
Total Eastern Division	188,585	106,389	88,383	3,749	335	115,067	4,021	506,529	456,524	50,005

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF NOVEMBER, 1969

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	Nov., 1969	Nov., 1968	
CENTRAL DIVISION-VA.										
Richmond District	99,976	76,535	47,771	97	166	24,496	-0-	249,041	228,709	20,332
Petersburg District	23,374	10,558	84,679	348	26	9,559	400	128,944	112,445	16,499
Total Central Division-Va.	123,350	87,093	132,450	445	192	34,055	400	377,985	341,154	36,831
EASTERN DIVISION										
Norfolk District-Va.	111,666	70,377	52,137	2,613	245	64,505	3,606	305,149	271,564	33,585
Norfolk District-N.C.	206	20	-0-	-0-	-0-	6		232	223	9
Total Norfolk District	111,872	70,397	52,137	2,613	245	64,511	3,606	305,381	271,787	33,594
Peninsula District-Va.	45,443	33,432	37,006	1,095	93	43,904		164,973	150,794	14,179
Total Eastern Division	161,315	103,829	89,143	3,708	338	108,415	3,606	470,354	422,581	47,773

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF OCTOBER 1969

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	OCT. 1969	OCT. 1968	
CENTRAL DIVISION-VA.										
Richmond District	79,902	80,889	48,908	133	168	23,300		233,300	226,486	6,814
Petersburg District	23,053	11,716	82,390	348	25	8,813	329	126,684	117,833	8,851
Total Central Division-Va.	102,955	92,605	131,298	481	193	32,113	329	359,984	344,319	15,665
EASTERN DIVISION										
Norfolk District-Va.	107,760	80,683	55,969	2,636	253	71,285	3,489	322,075	289,183	32,892
Norfolk District-N.C.	16	2						18	15	3
Total Norfolk District	107,776	80,685	55,969	2,636	253	71,285	3,489	322,093	289,198	32,895
Peninsula District-Va.	52,322	37,378	35,770	1,088	90	47,537		174,185	162,679	11,506
Total Eastern Division	160,098	118,063	91,739	3,724	343	118,822	3,489	496,278	452,077	44,201

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF SEPTEMBER 1969

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL SEP 1969	TOTAL SEP 1968	INCREASE
<b>OPERATING REVENUE ACCOUNTS</b>										
CENTRAL DIVISION-VA.										
Richmond District	131,497	95,501	52,306	129	166	24,413		304,012	293,285	10,727
Petersburg District	27,259	14,017	85,326	347	25	9,294	383	136,651	128,742	7,909
Total Central Division-Va.	158,756	109,518	137,632	476	191	33,707	383	440,663	422,027	18,636
<b>EASTERN DIVISION</b>										
Norfolk District-Va.	150,348	93,476	53,421	2,582	240	75,164	4,049	379,280	351,162	28,118
Norfolk District-N.C.	280	97				2		379	276	103
Total Norfolk District	150,628	93,473	53,421	2,582	240	75,166	4,049	379,659	351,438	28,221
Peninsula District-Va.	67,226	42,303	36,230	1,083	90	49,165		196,097	186,144	9,953
Total Eastern Division	217,854	135,876	89,651	3,665	330	124,331	4,049	575,756	537,582	38,174

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF AUGUST 1969

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL AUG. 1969	TOTAL AUG. 1968	INCREASE
<b>OPERATING REVENUE ACCOUNTS</b>										
CENTRAL DIVISION-VA.										
Richmond District	98,268	96,076	56,154	127	166	22,576		273,367	251,640	21,727
Petersburg District	28,793	13,905	83,510	346	24	10,211	389	137,178	126,470	10,708
Total Central Division-Va.	127,061	109,981	139,664	473	190	32,787	389	410,545	378,110	32,435
<b>EASTERN DIVISION</b>										
Norfolk District-Va.	151,488	96,544	52,818	2,641	239	75,600	4,570	383,903	351,226	32,678
Norfolk District-N.C.	16							16	8	8
Total Norfolk District	151,504	96,544	52,818	2,641	239	75,600	4,570	383,919	351,234	32,685
Peninsula District-Va.	77,666	46,011	37,291	1,086	90	48,386		210,530	199,907	10,623
Total Eastern Division	229,170	142,555	90,109	3,727	329	123,986	4,570	594,449	551,141	43,308

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF JULY 1969

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL JULY 1969	TOTAL JULY 1968	INCREASE
<b>OPERATING REVENUE ACCOUNTS</b>										
CENTRAL DIVISION-VA.										
Richmond District	116,170	96,481	51,954	127	166	24,443		289,341	244,576	44,765
Petersburg District	25,207	13,647	78,493	346	25	10,639	419	128,776	117,335	11,441
Total Central Division-Va.	141,377	110,128	130,447	473	191	35,082	419	418,117	361,911	56,206
<b>EASTERN DIVISION</b>										
Norfolk District-Va.	144,201	94,403	52,611	2,557	239	76,347	4,021	374,379	333,259	41,120
Norfolk District-N.C.	231	37		1		4		273	239	34
Total Norfolk District	144,432	94,440	52,611	2,558	239	76,351	4,021	374,652	333,498	41,154
Peninsula District-Va.	71,252	44,607	37,233	1,070	90	52,268		206,520	179,530	26,990
Total Eastern Division	215,684	139,047	89,844	3,628	329	128,619	4,021	581,172	513,028	68,144

SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF JUNE, 1969

	440.0	442.1	442.2	444.1	444.2	445.0	447.0	TOTAL JUNE, 1969	TOTAL JUNE, 1968	INCREASE
<b>OPERATING REVENUE ACCOUNTS</b>										
CENTRAL DIVISION-VA.										
Richmond District	66,493	81,823	53,285	128	165	22,595		224,489	194,618	29,871
Petersburg District	19,855	11,820	85,046	348	24	9,741	337	127,171	109,047	18,124
Total Central Division-Va.	86,348	93,643	138,331	476	189	32,336	337	351,660	303,665	47,995
<b>EASTERN DIVISION</b>										
Norfolk District-Va.	97,386	79,044	52,098	2,613	239	73,584	3,836	308,800	266,466	42,334
Norfolk District-N.C.	4							4	(5)	9
Total Norfolk District	97,390	79,044	52,098	2,613	239	73,584	3,836	308,804	266,461	42,343
Peninsula District-Va.	51,824	38,648	37,366	1,062	90	56,948		145,938	137,824	8,114
Total Eastern Division	149,214	117,692	89,464	3,675	329	130,532	3,836	454,742	404,285	50,457

VIRGINIA ELECTRIC AND POWER COMPANY  
SUMMARY OF KILOWATT HOURS (IN THOUSANDS)  
MONTH OF MAY, 1969

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	MAY, 1969	MAY, 1968	
CENTRAL DIVISION-VA.										
Richmond District	89,545	69,911	49,328	127	166	22,727		231,804	209,432	22,372
Petersburg District	21,565	10,426	80,029	345	25	8,923	598	121,911	108,000	12,911
Total Central Division-Va.	111,110	80,337	129,357	472	191	31,650	598	353,715	318,392	35,323
EASTERN DIVISION										
Norfolk District-Va.	98,239	65,278	51,657	2,505	238	62,068	3,209	283,194	254,958	28,236
Norfolk District-N.C.	224	20				6		250	228	22
Total Norfolk District	98,463	65,298	51,657	2,505	238	62,074	3,209	283,444	255,186	28,258
Peninsula District-Va.	44,783	31,403	30,747	1,058	79	47,287		155,357	142,609	12,748
Total Eastern Division	143,246	96,701	82,404	3,563	317	109,361	3,209	438,801	397,795	41,006

VIRGINIA ELECTRIC AND POWER COMPANY  
ELECTRIC CUSTOMERS  
MAY 1971

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	May 1971	May 1970	
CENTRAL DIVISION-VA.										
Richmond District	168 060	15 902	209	67	29	1 909	2	186 176	182 859	3 317
Petersburg District	41 002	4 322	52	27	14	547	1	45 964	45 002	962
Total Central Division-VA.	209 062	20 223	261	94	43	2 456	1	232 140	227 861	4 279
EASTERN DIVISION										
Norfolk District-VA.	199 887	20 150	141	42	19	1 842	1	222 082	217 837	4 245
Norfolk District-N.C.	437	37		1		2		477	375	102
Total Norfolk District	200,324	20 187	141	43	19	1 844	1	222 559	218 212	4 347
Peninsula District-VA.	86 332	7 936	31	19	9	872		95 199	94 109	1 090
Total Eastern Division	286,656	28 123	172	62	28	2 716	1	317 758	312 321	5 437

ELECTRIC CUSTOMERS  
APRIL 1971

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	April 1971	April 1970	
CENTRAL DIVISION-VA.										
Richmond District	167 795	15 832	209	66	29	1 884	2	185 815	182 622	3 193
Petersburg District	40 057	4 327	51	27	14	545	1	45 923	44 950	972
Total Central Division-VA.	208 752	20 159	260	93	43	2 429	1	231 737	227 572	4 165
EASTERN DIVISION										
Norfolk District-VA.	199 341	20 075	141	41	19	1 833	1	221 451	217 158	4 293
Norfolk District-N.C.	431	35		1		2		469	363	106
Total Norfolk District	199 772	20 110	141	42	19	1 835	1	221 920	217 521	4 399
Peninsula District-VA.	86 124	7 913	31	19	9	866		94 992	94 063	929
Total Eastern Division	285 896	28 023	172	61	28	2 701	1	316 912	311 584	5 328

ELECTRIC CUSTOMERS  
MARCH 1971

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	March '71	March '70	
CENTRAL DIVISION-VA.										
Richmond District	167 792	15 825	211	64	29	1 894		185 805	182 583	3 202
Petersburg District	40 825	4 293	51	27	14	543	1	45 754	44 936	818
Total Central Division-VA.	208 617	20 118	262	91	43	2 427	1	231 559	227 439	4 120
EASTERN DIVISION										
Norfolk District-VA.	199 164	20 039	141	41	19	1 828	1	221 233	216 985	4 248
Norfolk District-N.C.	426	35		1		2		464	357	107
Total Norfolk District	199 590	20 074	141	42	19	1 830	1	221 697	217 342	4 355
Peninsula District-VA.	85 975	7 901	31	19	9	866		94 801	94 103	698
Total Eastern Division	285 565	27 975	172	61	28	2 696	1	316 498	311 445	5 053

ELECTRIC CUSTOMERS  
FEBRUARY 1971

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	Feb. 1971	Feb. 1970	
CENTRAL DIVISION-VA.										
Richmond District	167 655	15 861	212	64	28	1 898		185 718	182 369	3 349
Petersburg District	40 752	4 282	51	27	14	548	1	45 675	44 850	825
Total Central Division-VA.	208 407	20 143	263	91	42	2 446	1	231 393	227 219	4 174
EASTERN DIVISION										
Norfolk District-VA.	198 722	20 020	141	41	19	1 825	1	220 769	217 006	3 763
Norfolk District-N.C.	416	35		1		2		454	357	97
Total Norfolk District	199 138	20 055	141	42	19	1 827	1	221 223	217 363	3 860
Peninsula District-VA.	85 950	7 895	31	18	9	865		94 768	94 204	564
Total Eastern Division	285 088	27 950	172	60	28	2 692	1	315 991	311 567	4 424

## ELECTRIC CUSTOMERS

	JANUARY 1971 OPERATING REVENUE ACCOUNTS						TOTAL	TOTAL	INCREASE	
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	Jan. 1971	Jan. 1970	
CENTRAL DIVISION-VA.										
Richmond District	167 670	15 906	213	64	28	1 890		185 771	182 298	3 473
Petersburg District	40 731	4 295	51	27	14	549	1	45 668	44 762	906
Total Central Division-VA.	208 401	20 201	264	91	42	2 439	1	231 439	227 060	4 379
EASTERN DIVISION										
Norfolk District-VA.	198 446	20 012	143	41	19	1 823	1	220 424	217 062	3 362
Norfolk District-W.C.	407	35		1		2		415	358	57
Total Norfolk District	198 853	20 047	143	42	19	1 825	1	220 839	217 420	3 419
Peninsula District-VA.	86 115	7 887	31	18	9	862		94 922	94 202	720
Total Eastern Division	284 968	27 934	174	60	27	2 687	1	315 761	311 622	4 139

Electric Customers  
December 1970

	OPERATING REVENUE ACCOUNTS						TOTAL	TOTAL	INCREASE	
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	Dec. 1970	Dec. 1969	
CENTRAL DIVISION-VA.										
Richmond District	167 258	15 929	215	65	25	1 818	1	185 321	181 799	3 522
Petersburg District	40 580	4 300	51	27	14	544	1	45 517	44 606	911
Total Central Division-VA.	207 838	20 229	266	92	39	2 362	1	230 838	226 405	4 433
EASTERN DIVISION										
Norfolk District-VA.	198 096	20 075	144	40	19	1 818	1	220 193	216 624	3 569
Norfolk District-W.C.	397	35		1		2		435	353	82
Total Norfolk District	198 493	20 110	144	41	19	1 820	1	220 628	216 987	3 641
Peninsula District-VA.	85 984	7 903	30	18	9	859		94 803	94 025	778
Total Eastern Division	284 477	28 013	174	59	28	2 679	1	315 431	311 012	4 419

Electric Customers  
November 1970

	OPERATING REVENUE ACCOUNTS						TOTAL	TOTAL	INCREASE	
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	Nov. 1970		Nov. 1969
CENTRAL DIVISION-VA.										
Richmond District	166 620	15 867	215	65	24	1 837		184 628	181 217	3 411
Petersburg District	40 627	4 296	51	27	15	541	1	45 558	44 469	1 089
Total Central Division-VA.	207 247	20 163	266	92	39	2 378	1	230 186	225 686	4 500
EASTERN DIVISION										
Norfolk District-VA.	197 822	20 055	144	40	19	1 809	1	219 890	216 185	3 705
Norfolk District-W.C.	391	36		1		2		430	353	77
Total Norfolk District	198 213	20 091	144	41	19	1 811	1	220 320	216 538	3 782
Peninsula District-VA.	85 909	7 921	30	18	9	857		94 744	93 697	1 047
Total Eastern Division	284 122	28 012	174	59	28	2 668	1	315 064	310 235	4 829

Electric Customers  
October 1970

	OPERATING REVENUE ACCOUNTS						TOTAL	TOTAL	INCREASE	
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	Oct. 1970	Oct. 1969	
CENTRAL DIVISION-VA.										
Richmond District	166 151	15 885	215	63	24	1 832		184 170	180 831	3 339
Petersburg District	40 406	4 275	51	27	16	540	1	45 396	44 354	1 042
Total Central Division-VA.	206 557	20 160	266	90	40	2 372		229 566	225 185	4 381
EASTERN DIVISION										
Norfolk District-VA.	197 307	20 024	145	39	19	1 797	1	219 332	215 824	3 508
Norfolk District-W.C.	380	37		1		2		420	356	64
Total Norfolk District	197 687	20 061	145	40	19	1 799	1	219 752	216 180	3 572
Peninsula District-VA.	85 669	7 885	30	18	9	855		94 466	93 572	894
Total Eastern Division	283 356	27 946	175	58	28	2 654	1	314 218	309 752	4 466

Electric Customers  
September 1970

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	Sept. 1970	Sept. 1969	
CENTRAL DIVISION-VA.										
Richmond District	165 751	15 835	214	63	24	1 692		183 579	180 368	3 211
Petersburg District	40 404	4 312	50	24	16	538	1	45 345	44 209	1 136
Total Central Division-VA.	206 155	20 147	264	87	40	2 230	1	228 924	224 577	4 347
EASTERN DIVISION										
Norfolk District-VA.	197 124	20 015	146	39	19	1 780	1	219 124	215 838	3 286
Norfolk District-W.C.	368	37		1		2		408	350	58
Total Norfolk District	197 492	20 052	146	40	19	1 782	1	219 532	216 188	3 344
Peninsula District-VA.	85 527	7 880	30	18	9	849		94 313	93 249	1 064
Total Eastern Division	283 019	27 932	176	58	28	2 631	1	313 845	309 437	4 408

Electric Customers  
August 1970

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	August 1970	August 1969	
CENTRAL DIVISION-VA.										
Richmond District	165 437	15 838	213	63	24	1 689		183 266	179 757	3 509
Petersburg District	40 350	4 306	49	24	16	531	1	45 277	44 041	1 236
Total Central Division-VA.	205 787	20 144	264	87	40	2 220	1	228 543	223 798	4 745
EASTERN DIVISION										
Norfolk District-VA.	196 986	19 998	147	38	19	1 754	1	218 943	215 521	3 422
Norfolk District-W.C.	363	38		1		2		404	354	50
Total Norfolk District	197 349	20 036	147	39	19	1 756	1	219 347	215 875	3 472
Peninsula District-VA.	85 308	7 885	30	18	9	842		94 092	93 059	1 033
Total Eastern Division	282 657	27 921	177	57	28	2 598	1	313 439	308 934	4 505

SUMMARY OF ELECTRIC CUSTOMERS  
JULY 1970

Corrected 7-2-70

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	JULY 1970	JULY 1969	
CENTRAL DIVISION-VA.										
Richmond District	165,245	15,841	217	62	23	1,699		183,087	179,476	3,611
Petersburg District	40,190	4,296	49	24	16	534	1	45,210	43,669	1,541
Total Central Division-VA.	205,535	20,137	266	86	39	2,233	1	228,297	223,145	5,152
EASTERN DIVISION										
Norfolk District-VA.	196,976	20,005	146	38	19	1,738	1	218,923	214,990	3,933
Norfolk District-W.C.	358	39		1		2		400	347	53
Total Norfolk District	196,934	20,044	146	39	19	1,740	1	218,923	215,337	3,586
Peninsula District-VA.	85,406	7,817	30	18	9	839		94,189	92,627	1,562
Total Eastern Division	282,340	27,861	176	57	28	2,579	1	313,112	308,164	4,948

SUMMARY OF ELECTRIC CUSTOMERS  
JUNE 1970

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	JUNE 1970	JUNE 1969	
CENTRAL DIVISION-VA.										
Richmond District	165,142	15,877	220	62	23	1,705		183,029	179,155	3,874
Petersburg District	40,168	4,213	47	24	16	532	1	45,103	42,719	2,384
Total Central Division-VA.	205,310	20,190	267	86	39	2,237	1	228,132	222,874	5,258
EASTERN DIVISION										
Norfolk District-VA.	196,165	19,970	146	37	19	1,730	1	218,068	214,371	3,697
Norfolk District-W.C.	377	36		1		2		376	338	38
Total Norfolk District	196,532	20,006	146	38	19	1,732	1	218,444	214,709	3,735
Peninsula District-VA.	85,334	7,890	31	18	9	838		94,140	92,679	1,461
Total Eastern Division	281,866	27,896	177	56	28	2,570	1	312,584	307,348	5,236

## MAY 1970

	OPERATING REVENUE ACCOUNTS						TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	MAY 1970	MAY 1969	
CENTRAL DIVISION-Va.									
Richmond District	165,008	15,850	219	62	23	1,697	182,859	178,908	3,950
Petersburg District	40,080	4,307	49	24	16	525	45,002	43,629	1,373
Total Central Division-Va.	205,088	20,157	268	86	39	2,222	227,861	222,538	5,323
EASTERN DIVISION									
Norfolk District-Va.	195,922	19,985	148	37	19	1,725	217,877	213,879	3,998
Norfolk District-N.C.	329	33		1		2	375	335	40
Total Norfolk District	196,261	20,018	148	38	19	1,727	218,252	214,214	3,998
Peninsula District-Va.	85,332	7,886	31	18	9	833	94,159	92,500	1,659
Total Eastern Division	281,593	27,904	179	56	28	2,560	312,411	306,714	5,697

SUMMARY OF ELECTRIC CUSTOMERS  
MONTH OF APRIL 1970

	OPERATING REVENUE ACCOUNTS						TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	APRIL 1970	APRIL 1969	
CENTRAL DIVISION-Va.									
Richmond District	164,783	15,841	217	62	23	1,696	182,622	178,662	3,960
Petersburg District	40,030	4,305	49	24	16	525	44,950	43,551	1,399
Total Central Division-Va.	204,813	20,146	266	86	39	2,221	227,572	222,213	5,359
EASTERN DIVISION									
Norfolk District-Va.	195,302	19,936	148	37	19	1,715	217,158	213,138	4,020
Norfolk District-N.C.	329	31		1		2	363	311	52
Total Norfolk District	195,631	19,967	148	38	19	1,717	217,521	213,449	4,052
Peninsula District-Va.	85,201	7,886	31	18	9	828	94,063	92,168	1,915
Total Eastern Division	280,922	27,853	179	56	28	2,545	311,584	305,617	5,967

SUMMARY OF ELECTRIC CUSTOMERS  
MONTH OF MARCH 1970

	OPERATING REVENUE ACCOUNTS						TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	MAR. 1970	MAR. 1969	
CENTRAL DIVISION-Va.									
Richmond District	164,666	15,847	218	60	23	1,699	182,503	178,456	4,047
Petersburg District	40,022	4,303	51	24	14	521	44,936	43,456	1,480
Total Central Division-Va.	204,688	20,150	269	84	37	2,220	227,439	221,912	5,527
EASTERN DIVISION									
Norfolk District-Va.	195,131	19,931	150	37	19	1,716	216,985	212,794	4,191
Norfolk District-N.C.	323	31		1		2	357	330	27
Total Norfolk District	195,454	19,962	150	38	19	1,718	217,342	213,124	4,218
Peninsula District-Va.	85,223	7,891	30	18	9	825	94,101	91,928	2,173
Total Eastern Division	280,784	27,853	150	56	28	2,543	311,443	305,052	6,391

SUMMARY OF ELECTRIC CUSTOMERS  
MONTH OF FEBRUARY 1970

	OPERATING REVENUE ACCOUNTS						TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	FEB. 1970	FEB. 1969	
CENTRAL DIVISION-Va.									
Richmond District	164,600	15,880	218	55	23	1,593	182,369	178,131	4,238
Petersburg District	39,936	4,303	51	24	14	511	44,850	43,378	1,472
Total Central Division - Va.	204,536	20,183	269	79	37	2,114	227,219	221,509	5,710
EASTERN DIVISION									
Norfolk District-Va.	195,175	19,914	148	36	18	1,714	217,006	212,373	4,633
Norfolk District-N.C.	324	30		1		2	357	325	32
Total Norfolk District	195,499	19,944	148	37	18	1,716	217,363	212,697	4,666
Peninsula District-Va.	85,281	7,921	30	18	9	825	94,206	92,434	1,910
Total Eastern Division	280,880	27,875	178	55	27	2,541	311,967	304,951	6,616



SUMMARY OF ELECTRIC CUSTOMERS  
MONTH OF JANUARY 1970

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	JAN., 1970	JAN., 1969	
CENTRAL DIVISION-VA.										
Richmond District	164,530	15,881	217	54	23	1,593		182,298	177,576	4,722
Petersburg District	39,852	4,294	51	24	14	526	1	44,762	43,271	1,491
Total Central Division-Va.	204,382	20,175	268	78	37	2,119	1	227,060	220,847	6,213
EASTERN DIVISION										
Norfolk District-Va.	195,204	19,945	150	36	18	1,708	1	217,062	211,941	5,121
Norfolk District-N.C.	325	30		1		2		358	322	36
Total Norfolk District	195,529	19,975	150	37	18	1,710	1	217,420	212,263	5,157
Peninsula District-Va.	85,388	7,934	30	18	9	823		94,202	92,098	2,104
Total Eastern Division	280,917	27,909	180	55	27	2,533	1	311,622	304,361	7,261

SUMMARY OF ELECTRIC CUSTOMERS  
MONTH OF DECEMBER 1969

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	DEC., 1969	DEC., 1968	
CENTRAL DIVISION-VA.										
Richmond District	164,097	15,847	215	54	23	1,563		181,799	176,919	4,880
Petersburg District	39,698	4,301	51	24	14	517	1	44,606	43,105	1,501
Total Central Division-Va.	203,795	20,148	266	78	37	2,080	1	226,405	220,024	6,381
EASTERN DIVISION										
Norfolk District-Va.	194,705	20,019	150	36	18	1,705	1	216,634	211,281	5,353
Norfolk District-N.C.	321	29		1		2		353	326	27
Total Norfolk District	195,026	20,048	150	37	18	1,707	1	216,987	211,607	5,380
Peninsula District-Va.	85,191	7,955	30	18	9	822		94,025	91,861	2,164
Total Eastern Division	280,217	28,003	180	55	27	2,529	1	311,012	303,468	7,544

MONTH OF NOVEMBER, 1969

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	Nov., 1969	Nov., 1968	
CENTRAL DIVISION-VA.										
Richmond District	163,552	15,815	217	55	23	1,555		181,217	176,398	4,819
Petersburg District	39,565	4,295	51	24	14	519	1	44,469	43,109	1,360
Total Central Division-Va.	203,117	20,110	268	79	37	2,074	1	225,686	219,507	6,179
EASTERN DIVISION										
Norfolk District-Va.	194,297	19,983	149	35	18	1,702	1	216,185	210,918	5,267
Norfolk District-N.C.	321	29		1		2		353	321	32
Total Norfolk District	194,618	20,012	149	36	18	1,704	1	216,538	211,239	5,299
Peninsula District-Va.	85,121	7,899	31	18	9	819		93,897	91,783	2,114
Total Eastern Division	279,739	27,911	180	54	27	2,523	1	310,435	303,022	7,413

SUMMARY OF ELECTRIC CUSTOMERS  
MONTH OF OCTOBER 1969

	OPERATING REVENUE ACCOUNTS							TOTAL	TOTAL	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0	OCT., 1969	OCT., 1968	
CENTRAL DIVISION-VA.										
Richmond District	163,161	15,828	214	54	23	1,551		180,831	175,633	5,198
Petersburg District	39,447	4,300	50	24	14	518	1	44,354	43,127	1,227
Total Central Division-Va.	202,608	20,128	264	78	37	2,069	1	225,185	218,760	6,425
EASTERN DIVISION										
Norfolk District-Va.	193,948	19,975	149	35	18	1,698	1	215,824	210,517	5,307
Norfolk District-N.C.	323	30		1		2		356	320	36
Total Norfolk District	194,271	20,005	149	36	18	1,700	1	216,180	210,837	5,343
Peninsula District-Va.	84,779	7,919	31	18	9	816		93,772	91,509	2,263
Total Eastern Division	279,050	27,924	180	54	27	2,516	1	309,952	302,346	7,606

SUMMARY OF ELECTRIC CUSTOMERS  
MONTH OF SEPTEMBER 1969

	OPERATING REVENUE ACCOUNTS						TOTAL SEPT., 1969	TOTAL SEPT., 1968	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0			
CENTRAL DIVISION-VA.									
Richmond District	162,733	15,812	210	54	23	1,536	280,368	174,630	5,738
Petersburg District	39,504	4,301	50	24	14	515	44,209	42,933	1,276
Total Central Division-Va.	202,037	20,113	260	78	37	2,051	224,577	217,563	7,014
EASTERN DIVISION									
Norfolk District-Va.	193,950	19,997	149	34	18	1,689	215,838	209,675	6,163
Norfolk District-N.C.	318	29		1		2	350	326	24
Total Norfolk District	194,268	20,026	149	35	18	1,691	216,188	210,001	6,187
Peninsula District-Va.	84,451	7,927	31	18	9	813	93,249	91,022	2,227
Total Eastern Division	278,719	27,953	180	53	27	2,504	309,437	301,023	8,414

SUMMARY OF ELECTRIC CUSTOMERS  
MONTH OF AUGUST 1969

	OPERATING REVENUE ACCOUNTS						TOTAL AUG., 1969	TOTAL AUG., 1968	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0			
CENTRAL DIVISION-VA.									
Richmond District	162,167	15,778	208	53	23	1,528	179,757	174,420	5,337
Petersburg District	39,145	4,299	50	24	14	508	44,041	42,760	1,281
Total Central Division-Va.	201,312	20,077	258	77	37	2,036	223,798	217,180	6,618
EASTERN DIVISION									
Norfolk District-Va.	193,631	20,011	150	34	18	1,676	215,521	209,797	5,724
Norfolk District-N.C.	321	30		1		2	354	320	34
Total Norfolk District	193,952	20,041	150	35	18	1,678	215,875	210,117	5,758
Peninsula District-Va.	84,250	7,933	31	18	9	818	93,059	90,871	2,188
Total Eastern Division	278,202	27,974	181	53	27	2,496	308,934	300,988	7,946

SUMMARY OF ELECTRIC CUSTOMERS  
MONTH OF JULY 1969

	OPERATING REVENUE ACCOUNTS						TOTAL JULY 1969	TOTAL JULY 1968	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0			
CENTRAL DIVISION-VA.									
Richmond District	161,928	15,728	208	53	23	1,536	179,476	173,952	5,524
Petersburg District	38,993	4,285	48	24	14	504	43,869	42,648	1,221
Total Central Division-Va.	200,921	20,013	256	77	37	2,040	223,345	216,600	6,745
EASTERN DIVISION									
Norfolk District-Va.	193,056	20,061	150	34	18	1,670	214,990	209,660	5,330
Norfolk District-N.C.	315	28		1		2	347	314	33
Total Norfolk District	193,372	20,089	150	35	18	1,672	215,337	209,974	5,363
Peninsula District-Va.	83,992	7,961	31	18	9	816	92,827	90,881	1,946
Total Eastern Division	277,364	28,050	181	53	27	2,488	308,164	300,855	7,309

SUMMARY OF ELECTRIC CUSTOMERS  
MONTH OF JUNE, 1969

	OPERATING REVENUE ACCOUNTS						TOTAL JUNE, 1969	TOTAL JUNE, 1968	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0			
CENTRAL DIVISION-VA.									
Richmond District	161,652	15,690	207	53	23	1,530	179,155	173,689	5,466
Petersburg District	38,851	4,277	48	24	14	504	43,719	42,508	1,211
Total Central Division-Va.	200,503	19,967	255	77	37	2,034	222,874	216,197	6,677
EASTERN DIVISION									
Norfolk District-Va.	192,482	20,011	150	34	18	1,675	214,371	208,891	5,480
Norfolk District-N.C.	310	26		1		2	338	303	35
Total Norfolk District	192,792	20,037	150	34	18	1,677	214,709	209,194	5,515
Peninsula District-Va.	83,806	7,962	31	18	9	813	92,659	90,443	2,196
Total Eastern Division	276,598	27,999	181	52	27	2,490	307,368	299,637	7,731

MONTH OF MAY, 1969

	OPERATING REVENUE ACCOUNTS							TOTAL MAY, 1969	TOTAL MAY, 1968	INCREASE
	440.0	442.1	442.2	444.1	444.2	445.0	447.0			
CENTRAL DIVISION-VA.										
Richmond District	161,494	15,643	203	53	23	1,493		178,909	173,574	5,335
Petersburg District	38,764	4,275	48	24	13	504	1	43,629	42,352	1,277
Total Central Division-Va.	200,258	19,918	251	77	36	1,997	1	222,538	215,926	6,612
EASTERN DIVISION										
Norfolk District-Va.	192,053	19,953	149	34	18	1,671	1	213,879	208,473	5,406
Norfolk District-N.C.	308	25				2		335	300	35
Total Norfolk District	192,361	19,978	149	34	18	1,673	1	214,214	208,773	5,441
Peninsula District-Va.	83,667	7,960	31	18	9	815		92,500	90,229	2,271
Total Eastern Division	276,028	27,938	180	52	27	2,488	1	306,714	299,002	7,712

1970 ELECTRICITY SALES IN KWH FOR ALL COOPS SERVICING RICHEL

<u>Electric Cooperative</u>	<u>Average # of Residential Customers</u>	<u>Residential KWH Sold</u>	<u>Average # of Commercial Customers</u>	<u>Commercial KWH Sold</u>	<u>Total 1970 KWH Sold</u>
Central Virginia	10,474	66,648,478	563	33,865,377	101,266,772
Community	7,708	33,078,045	192	4,977,748	38,926,128
Mecklenburg	14,584	87,702,867	895	25,612,087	119,067,537
Prince George	3,371	25,847,568	115	2,775,421	28,622,989
Southside	18,571	114,068,706	622	56,840,203	176,307,425
Virginia	<u>15,359</u>	<u>99,293,817</u>	<u>1,021</u>	<u>69,429,700</u>	<u>172,671,438</u>
Total	70,067	426,663,948	3,408	193,350,536	620,164,484

<u>Electric Cooperative</u>	<u>KWH/Residential</u>	<u>KWH/Commercial</u>
Central Virginia	6,363.23	60,151.65
Community	4,291.39	25,925.77
Mecklenburg	6,013.64	28,616.86
Prince George	7,667.63	24,134.10
Southside	6,142.30	91,382.96
Virginia	<u>6,464.86</u>	<u>68,001.67</u>
Average	6,089.02	56,778.33

Electric Cooperative Area of Service  
And Number of Customers

<u>Counties</u>	<u>Electric Cooperative</u>	<u>1969</u>		<u>1970</u>	
		<u>Meters</u>	<u>Services</u>	<u>Meters</u>	<u>Services</u>
Charles City	-	-	-	-	-
Chesterfield	Southside	319	-	331	-
Dinwiddie	Prince George	246	314	255	321
	Southside	2,076	-	2,172	-
Goochland	Central Virginia	234	-	243	-
	Virginia	154	-	172	-
Greensville	Mecklenburg	1,870	-	1,924	-
Hanover	Virginia	2,553	-	2,619	-
Henrico	-	-	-	-	-
Isle of Wight	Community	1,468	1,569	1,536	1,637
	Prince George	10	10	9	10
James City	-	-	-	-	-
Nansemond	Community	1,500	1,636	1,523	1,658
New Kent	-	-	-	-	-
Powhatan	Southside	866	-	917	-
Prince George	Prince George	1,279	1,348	1,360	1,439
	Southside	14	-	14	-
Southampton	Community	1,921	2,185	1,961	2,218
	Mecklenburg	215	-	217	-
	Prince George	8	10	8	10
Surry	Prince George	846	963	898	1,066
Sussex	Community	30	36	31	36
	Mecklenburg	148	-	145	-
	Prince George	1,480	963	1,443	985
	Southside	68	-	68	-

\*Total Customers for each Cooperative

<u>Electric Cooperative</u>	<u>1969</u>		<u>1970</u>	
	<u>Meters</u>	<u>Services</u>	<u>Meters</u>	<u>Services</u>
Central Virginia	11,665	-	11,882	-
Community	5,426	-	5,549	-
Mecklenburg	16,706	-	17,172	-
Prince George	3,869	3,642	3,973	3,831
Southside	19,269	-	19,949	-
Virginia	17,103	-	17,865	-

\*not limited to test site

RICHEL NON-ROAD VEHICLE TRANSPORTATION  
SOURCES OF AIR POLLUTANTS  
(Tons/yr)

	<u>SOx</u>	<u>Part</u>	<u>CO</u>	<u>HC</u>	<u>NOx</u>	<u>Total</u>
Aircraft						
Jet	284	1,085	2,454	1,732	949	6,504
Piston	589	1,006	60,947	7,931	98	70,571
Turboprop	186	1,118	373	559	1,076	3,312
Subtotal	1,059	3,209	63,774	10,222	2,123	80,387
Railroads	606	233	653	466	699	2,657
Vessels	-	2,647	1,583	1,237	1,781	7,248
Total	1,665	6,089	66,010	11,925	4,603	90,292

This table is from data supplied by the Virginia Air Pollution Board, 1971. No railraod data is supplied from the Norfolk-Portsmouth area. No SOx is attributed to vessel traffic. No military aviation is recognized.

# Non-Transportation

## ANNUAL FUEL CONSUMPTION

Region 5

JURISDICTION	STEAM-ELECTRIC	INDUSTRY	COMMERCIAL	RESIDENTIAL	TOTAL
Coal (tons/yr)					
RICHMOND	122000.	346000.	12200.	35480.	515679.
HANOVER	0.	0.	0.	2030.	2030.
HENRICO	0.	0.	0.	5983.	5983.
NEW KENT	0.	0.	0.	136.	136.
CHARLES CITY	0.	0.	0.	139.	139.
GOCCHLAND	0.	0.	4000.	817.	4817.
POWHATAN	0.	0.	0.	337.	337.
PRINCE GEO	0.	100000.	9000.	41.	109041.
DINWIDDIE	0.	0.	11000.	0.	11000.
CHESTERFIELD	1318000.	0.	4500.	5075.	1327575.
GREENSVILLE	0.	0.	0.	0.	0.
SURRY	0.	0.	0.	519.	519.
SUSSEX	0.	20000.	0.	472.	20472.
TOTALS	1440000.	466000.	40700.	51029.	1997727.

## Dist. Oil (1000 Gal/yr)

RICHMOND	0.	4629.	341.	45365.	50335.
HANOVER	0.	0.	0.	6900.	6900.
HENRICO	0.	344.	0.	25531.	25875.
NEW KENT	0.	0.	0.	714.	714.
CHARLES CITY	0.	0.	0.	1053.	1053.
GOCCHLAND	0.	0.	0.	1952.	1952.
POWHATAN	0.	0.	0.	933.	933.
PRINCE GEO	0.	182.	2223.	177.	2582.
DINWIDDIE	0.	0.	0.	0.	0.
CHESTERFIELD	0.	0.	0.	13045.	13045.
GREENSVILLE	0.	0.	0.	2113.	2113.
SURRY	0.	0.	0.	1352.	1352.
SUSSEX	0.	0.	0.	1040.	1040.
TOTALS	0.	5155.	2564.	100174.	107893.

## Resid. Oil (1000 gal/yr)

RICHMOND	0.	8279.	909.	0.	9188.
HANOVER	0.	0.	0.	0.	0.
HENRICO	0.	224.	0.	0.	224.
NEW KENT	0.	0.	0.	0.	0.
CHARLES CITY	0.	0.	0.	0.	0.
GOCCHLAND	0.	0.	0.	0.	0.
POWHATAN	0.	0.	0.	0.	0.
PRINCE GEO	0.	56300.	424.	0.	56724.
DINWIDDIE	0.	0.	0.	0.	0.
CHESTERFIELD	284512.	4018.	376.	0.	288906.
GREENSVILLE	0.	650.	0.	0.	650.
SURRY	0.	0.	0.	0.	0.
SUSSEX	0.	0.	0.	0.	0.
TOTALS	284512.	69471.	1709.	0.	355692.

## Nat. Gas (mil cu ft/yr)

RICHMOND	0.	753.	551.	11356.	12660.
HANOVER	0.	0.	0.	0.	0.
HENRICO	0.	0.	0.	1982.	1982.
NEW KENT	0.	0.	0.	0.	0.
CHARLES CITY	0.	0.	0.	0.	0.
GOCCHLAND	0.	0.	0.	0.	0.
POWHATAN	0.	0.	0.	0.	0.
PRINCE GEO	0.	158.	0.	25.	183.
DINWIDDIE	0.	0.	0.	0.	0.
CHESTERFIELD	0.	0.	0.	286.	286.
GREENSVILLE	0.	0.	0.	0.	0.
SURRY	0.	0.	0.	0.	0.
SUSSEX	0.	0.	0.	0.	0.
TOTALS	0.	911.	551.	13650.	15112.

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

ANNUAL FUEL CONSUMPTION					Region 6
JURISDICTION	STEAM-ELECTRIC	INDUSTRY	COMMERCIAL	RESIDENTIAL	TOTAL
1-Coal (Tons/yr)					
NAASEMEND		126,000.		2443.	128443.
ISLEOFWIGHT				755.	755.
SOUTHAMPTON		3,000.		1,000.	4,000.
JAMESCITY			9,000.	489.	9489.
YORK	676,000.			12331.	688331.
VIRGINIA BEACH				229.	229.
CHESAPEAKE		1113000.		7134.	11137134.
NORFOLK	125,000.	3000.		21587.	149587.
NEWPORT NEWS				6489.	6489.
HAMPTON				5935.	5935.
PORTSMOUTH		3000.		2569.	5569.
TOTALS	813,000.	1126500.	9000.	63917.	12138914.
Dist. Oil (1000 gal/yr)					
NAASEMEND		333.		7564.	7901.
ISLEOFWIGHT				3226.	3226.
SOUTHAMPTON		13.		3275.	3288.
JAMESCITY			49.	2428.	2477.
YORK	306.			4177.	4573.
VIRGINIA BEACH		532.		2468.	27212.
CHESAPEAKE		246.		11378.	11724.
NORFOLK	27.	57.	14.	12610.	13493.
NEWPORT NEWS		236.	1.	11561.	12396.
HAMPTON		371.	27.	8873.	9271.
PORTSMOUTH		13.		7614.	7627.
TOTALS	645.	2533.	15.	93728.	103117.
Resid. Oil (1000 gal/yr)					
NAASEMEND		26.	61.		2660.
ISLEOFWIGHT					
SOUTHAMPTON		406.			406.
JAMESCITY		9663.	182.		11487.
YORK		246.			290.
VIRGINIA BEACH		744.	21.		809.
CHESAPEAKE	249.	1659.			25050.
NORFOLK		2113.			3113.
NEWPORT NEWS		671.			671.
HAMPTON					
PORTSMOUTH		67.			67.
TOTALS	249.	19322.	2445.		270767.
Nat. Gas (Mil Cu Ft/yr)					
NAASEMEND		192.		104.	296.
ISLEOFWIGHT				14.	14.
SOUTHAMPTON					
JAMESCITY				8.	8.
YORK	687.				687.
VIRGINIA BEACH				436.	436.
CHESAPEAKE		1021.		671.	2591.
NORFOLK		68.	1.	411.	489.
NEWPORT NEWS		39.		201.	2121.
HAMPTON		2.		2175.	2177.
PORTSMOUTH		6.		2234.	2240.



COMBUSTION OF FUELS IN STATIONARY SOURCES  
IN THE STUDY AREA  
(TONS/YEAR)

Region 5

FUEL	USER CATEGORY	SOX	PART	CO	HC	NOX
COAL	INDUSTRIAL	8663.	27704.	471.	170.	3783.
	STEAM-ELECTRIC	27360.	112896.	720.	216.	12960.
	RESIDENTIAL	970.	306.	1276.	255.	128.
	COMM AND INST	693.	251.	103.	34.	244.
FUEL OIL	INDUSTRIAL	11702.	842.	8.	113.	2702.
	STEAM-ELECTRIC	49761.	1138.	6.	711.	14937.
	RESIDENTIAL	1803.	501.	250.	150.	601.
	COMM AND INST	348.	39.	0.	6.	154.
GAS	INDUSTRIAL	0.	10.	0.	22.	97.
	STEAM-ELECTRIC	0.	0.	0.	0.	0.
	RESIDENTIAL	4.	130.	136.	55.	512.
	COMM AND INST	0.	5.	6.	2.	21.
GRAND TOTAL		101304.	143822.	2976.	1735.	36137.

COMBUSTION OF FUELS IN STATIONARY SOURCES  
IN THE STUDY AREA  
(TONS/YEAR)

Region 6

FUEL	USER CATEGORY	SOX	PART	CO	HC	NOX
COAL	INDUSTRIAL	111.	577.	5684.	1715.	11275.
	STEAM-ELECTRIC	13518.	5872.	411.	12.	7218.
	RESIDENTIAL	1214.	284.	1598.	32.	161.
	COMM AND INST	752.	222.	18.	54.	118.
SUP-TOTAL		16496.	7155.	7865.	2219.	108752.
FUEL OIL	INDUSTRIAL	2638.	241.	2.	33.	797.
	STEAM-ELECTRIC	49514.	999.	5.	624.	13117.
	RESIDENTIAL	1795.	489.	249.	15.	598.
	COMM AND INST	14381.	1113.	1.	152.	3642.
SUP-TOTAL		69318.	2852.	267.	958.	18135.
GAS	INDUSTRIAL	1.	21.	1.	44.	194.
	STEAM-ELECTRIC	0.	5.	0.	14.	134.
	RESIDENTIAL	2.	78.	82.	33.	308.
	COMM AND INST	0.	8.	8.	3.	31.
SUP-TOTAL		4.	111.	91.	94.	666.
GRAND TOTAL		85817.	10017.	8222.	3261.	127553.

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN STUDY AREA, TONS/YEAR

Region 5

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
TRANSPORTATION					
ROAD VEHICLES	2162.	2135.	368268.	49595.	39113.
OTHER	673.	523.	1660.	1384.	870.
SUB-TOTAL	2835.	2658.	369928.	50979.	39983.
COMBUSTION OF FUELS					
INDUSTRY	20366.	28556.	479.	305.	6581.
STEAM-ELECTRIC	77121.	114034.	726.	927.	27897.
RESIDENTIAL	2777.	937.	1263.	460.	1240.
COMM AND INST.	1041.	295.	109.	43.	418.
SUB-TOTAL	101304.	143822.	2976.	1735.	36137.
REFUSE DISPOSAL					
INCINERATION	163.	1630.	2172.	1629.	217.
OPEN BURNING	39.	625.	3318.	1171.	234.
SUB-TOTAL	202.	2255.	5491.	2801.	452.
PROCESS	5853.	14546.	4029.	1946.	155.
EVAP LOSSES				26582.	
GRAND TOTAL	110195.	163280.	382423.	84142.	75727.

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN STUDY AREA, TONS/YEAR

Region 6

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
TRANSPORTATION					
ROAD VEHICLES	1146.	2336.	534335.	64345.	55581.
OTHER	992.	5566.	6435.	15367.	3559.
SUB-TOTAL	2138.	7902.	538870.	79711.	5917.
COMBUSTION OF FUELS					
INDUSTRY	4650.	938.	5032.	1702.	12256.
STEAM-ELECTRIC	6373.	6976.	411.	758.	2145.
RESIDENTIAL	312.	96.	1029.	52.	146.
COMM AND INST.	15132.	1343.	124.	210.	378.
SUB-TOTAL	85817.	1117.	9222.	3261.	127552.
REFUSE DISPOSAL					
INCINERATION	267.	2565.	1471.	1122.	484.
OPEN BURNING	35.	523.	2793.	126.	21.
SUB-TOTAL	301.	3088.	4264.	2149.	504.
PROCESS	1375.	3293.	430.	135.	2664.
EVAP LOSSES				2826.	
GRAND TOTAL	89631.	5416.	61165.	114538.	19173.

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

Region 5					
NUMBER OF HOUSING UNITS BY JURISDICTION					
COUNTY	COAL	CIL	GAS	TOTAL	1970 Housing Census
RICHMOND	8132.	64023.	98331.	170486.	87083.
PANOVER	400.	8371.	0.	8771.	10947.
HENRICO	1200.	31528.	15018.	47746.	49527.
NEW KENT	30.	968.	0.	998.	1632.
CHARLES CITY	30.	1400.	0.	1430.	1578.
GROCHLAND	170.	2500.	0.	2670.	2867.
POKHATAN	70.	1195.	0.	1265.	1971.
PRINCE GEO	100.	2658.	2284.	5042.	5902.
DINWIDDIE	200.	3597.	2000.	5797.	6198.
CHESTERFIELD	1000.	15826.	2132.	18958.	22984.
GREENSVILLE	0.	2810.	0.	2810.	2814.
SURRY	106.	1700.	0.	1806.	2041.
SUSSEX	100.	1357.	0.	1457.	3263.
STUDY AREA	11538.	137933.	119765.	269236.	198807.
PERCENT OF TOTAL	4.	51.	44.	100.	

Region 6					
NUMBER OF HOUSING UNITS BY JURISDICTION					
JURISDICTION	COAL	CIL	GAS	TOTAL	1970 Housing Census
MANSEMOND	985.	11275.	111.	12375.	10275.
ISLEOFWIGHT	104.	5116.	132.	5352.	5432.
SCOTTHAMPTON	258.	5184.	.	5442.	5442.
JAMES CITY	133.	474.	523.	530.	5030.
YOCPK	200.	6257.	.	9257.	9257.
VIRGINIA BEACH	63.	43141.	4319.	4776.	47960.
CHESAPEAKE	190.	17675.	639.	25865.	25865.
NORFOLK	600.	21914.	4319.	21923.	91065.
NEWPORT NEWS	1700.	19295.	2171.	41696.	41696.
HAMPTON	1500.	12934.	21124.	36558.	36556.
PORTSMOUTH	700.	12775.	2300.	36175.	36475.
STUDY AREA	1677.	169924.	91819.	259512.	315053.
PERCENT OF TOTAL	6.	62.	42.	100.	

Total in RICHEL 513860.

# TRENDS IN RESIDENTIAL FUEL CONSUMPTION

## Richmond SMSA

	<u>Heating Fuel</u>			
	1950 <sup>1</sup>		1960 <sup>2</sup>	
	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
Units reporting	64,020	25,815	99,676	19,283
Utility gas	1.36%	8.51%	18.77%	3.70%
Fuel oil, keros.	33.81	57.70	58.82	77.14
Coal	51.99	23.37	19.04	8.20
Electricity	0.10	.37	.23	.36
Bottled, LP gas	0.14	0.66	1.02	1.83
Wood & other	3.97	6.02	1.95	8.67
None	.91	.27	-	.12
<u>Water Heating Fuel</u>				
Utility gas	NR	NR	35.52%	3.67%
Electricity	NR	NR	22.83	52.51
Coal	NR	NR	5.99	.10
Bottled, LP gas	NR	NR	4.74	6.36
Fuel oil, keros.	NR	NNR	13.45	20.29
Wood & other	NR	NR	.35	.85
None	NR	NR	9.44	16.22
<u>Cooking Fuel</u>				
Utility gas	56.11%	1.92%	42.37%	2.48%
Electricity	12.80	18.84	40.61	65.23
Bottled, LP gas	1.70	17.62	9.31	22.47
Fuel oil, keros.	11.47	11.96	3.87	1.85
Wood & other	3.64	14.66	1.61	7.22
None	.54	.12	.32	.10

<sup>1</sup>Urban - Richmond, Non-urban - Chesterfield and Henrico County

<sup>2</sup>SMSA Urban and non-urban of Richmond city and counties of Chesterfield and Henrico County

NR - Not Reported

# TRENDS IN RESIDENTIAL FUEL CONSUMPTION

## Norfolk-Portsmouth SMSA

	<u>Heating Fuel</u>			
	1950 <sup>1</sup>		1960 <sup>2</sup>	
	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
Units reporting	76,125	35,740	139,510	13,298
Utility gas	4.54%	1.96%	27.70%	0.95%
Fuel oil, keros.	41.75	50.20	54.03	73.26
Coal	50.04	34.75	14.04	12.78
Electricity	0.13	1.33	0.79	1.45
Bottled, LP gas	0.15	2.25	1.63	3.17
Wood & other	2.64	11.32	1.68	7.71
None	0.50	1.55	0.13	0.68
<u>Water Heating Fuel</u>				
Utility gas	NR	NR	42.40%	1.14%
Electricity	NR	NR	23.37	46.76
Coal	NR	NR	5.88	0.32
Bottled, LP gas	NR	NR	5.20	10.04
Fuel oil, keros.	NR	NR	14.65	15.48
Wood & other	NR	NR	0.24	0.31
None	NR	NR	8.23	25.94
<u>Cooking Fuel</u>				
Utility gas	61.82%	24.09%	50.83%	1.62%
Electricity	9.45	25.67	33.49	55.63
Bottled, LP gas	2.53	19.70	11.06	32.04
Fuel oil, keros.	7.34	10.60	1.64	2.87
Coal	14.84	9.35	1.47	1.43
Wood & other	3.92	10.07	0.89	6.03
None	.34	0.20	0.46	0.38

<sup>1</sup>Urban - Norfolk, Portsmouth, So. Norfolk, Non-urban - Princess Anne County, Norfolk County

<sup>2</sup>SMSA urban and non-urban of Cities of Norfolk, Portsmouth, Chesapeake, and Virginia Beach

NR - Not Reported

# TRENDS IN RESIDENTIAL FUEL CONSUMPTION

## Newport News-Hampton SMSA

	<u>Heating Fuel</u>			
	1950 <sup>1</sup>		1960 <sup>2</sup>	
	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
Units reporting	13,170	3,010	55,499	4,111
Utility gas	4.33%	0.33%	29.67%	-%
Fuel oil, keros.	40.02	42.36	56.31	85.99
Coal	57.71	26.58	10.23	1.48
Electricity	-	0.10	.22	.51
Bottled, LP gas	-	0.83	1.77	2.09
Wood & other	3.38	26.91	1.35	9.93
None	.38	0.50	.43	-
<u>Water Heating Fuel</u>				
Utility gas	NR	NR	44.44%	0.58%
Electricity	NR	NR	27.39	61.81
Coal	NR	NR	3.16	-
Bottled, LP gas	NR	NR	5.80	8.44
Fuel oil, keros.	NR	NR	12.78	8.95
Wood & other	NR	NR	0.68	-
None	NR	NR	5.75	20.21
<u>Cooking Fuel</u>				
Utility gas	69.17%	1.50%	43.66%	0.58%
Electricity	3.49	21.26	41.57	58.33
Bottled, LP gas	0.80	15.78	10.25	33.45
Fuel oil, keros.	6.23	19.60	1.55	1.05
Coal	20.01	9.47	1.47	-
Wood & other	2.28	32.72	1.28	6.59
None	.38	-	0.23	-

<sup>1</sup>Rural - York County, Urban - Newport News and Hampton City

<sup>2</sup>SMSA Urban and Rural of York County and the cities of Newport News and Hampton

NR - Not Reported

TONS. PER DAY																
SOX			PART.			CO			HC			NOX				
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A		
1																
GENCRUSHSTON			GRID 2		PC 2759		VC 41946									
5	0.0	0.0	0.0	0.12	0.12	0.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL	0.0	0.0	0.0	0.12	0.12	0.12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2																
FRNKTFILIPPS			GRID 3		PC 2831		VC 41921									
5	0.00	0.00	0.00	0.10	0.10	0.10	0.65	0.65	0.65	0.05	0.05	0.05	0.00	0.00	0.00	
TOTAL	0.00	0.00	0.00	0.10	0.10	0.10	0.65	0.65	0.65	0.05	0.05	0.05	0.00	0.00	0.00	
3																
WCVENS FARM			GRID 5		PC 2450		VC 41732									
4	0.0	0.50	0.21	0.0	0.0	0.0	0.0	0.03	0.01	0.0	0.01	0.01	0.0	0.20	0.08	
TOTAL	0.0	0.50	0.21	0.0	0.0	0.0	0.0	0.03	0.01	0.0	0.01	0.01	0.0	0.20	0.08	
4																
RCKVILSTONCA			GRID 10		PC 2673		VC 41779									
5	0.0	0.0	0.0	0.15	0.15	0.15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL	0.0	0.0	0.0	0.15	0.15	0.15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5																
VULMATLRCSQ			GRID 11		PC 2682		VC 41784									
5	0.0	0.0	0.0	0.19	0.19	0.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL	0.0	0.0	0.0	0.19	0.19	0.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6																
HCLYFRMSPCUL			GRID 11		PC 2751		VC 41749									

Source: Virginia Air Pollution Control Board, 1971





12	RICHMDFENDRY	GRID	31	FC	2824	VC	416C1									
4	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.06	0.06	0.06
5	0.0	0.0	0.0	0.19	0.19	0.19	1.83	1.83	1.83	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.01	0.01	0.01	0.20	0.20	0.20	1.83	1.83	1.83	0.01	0.01	0.01	0.06	0.06	0.06	0.06

13	RICHMDGUANO	GRID	44	FC	2844	VC	41574									
5	0.0	0.0	0.0	0.02	0.02	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01

14	DMV	GRID	39	FC	2821	VC	41595									
4	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.01	0.01	0.01
TOTAL	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.01	0.01	0.01

15	EXPORTLEAFTB	GRID	40	FC	2827	VC	41594									
4	0.0	0.68	0.28	0.0	0.05	0.02	0.0	0.00	0.00	0.0	0.01	0.00	0.0	0.15	0.06	0.06
TOTAL	0.0	0.68	0.28	0.0	0.05	0.02	0.0	0.00	0.00	0.0	0.01	0.00	0.0	0.15	0.06	0.06

16	RICHMONWSPPR	GRID	40	FC	2845	VC	41577									
4	0.0	0.28	0.12	0.0	0.02	0.01	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.06	0.03	0.03
TOTAL	0.0	0.28	0.12	0.0	0.02	0.01	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.06	0.03	0.03

17	SAMSON PAINT	GRID	40	FC	2841	VC	41581									
4	0.0	0.02	0.01	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.01	0.00	0.00

4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.00	1.00	1.00	0.0	0.0	0.0
5	0.0	0.0	0.0	0.08	0.08	0.08	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.02	0.01	0.08	0.08	0.08	0.0	0.00	0.00	1.00	1.00	1.00	0.0	0.01	0.00

18

VCUACADEMIC	GRID	40	FC	2825	VC	41585									
4	0.0	0.30	0.12	0.0	0.03	0.01	0.0	0.00	0.00	0.0	0.01	0.00	0.0	0.14	0.06
TOTAL	0.0	0.30	0.12	0.0	0.03	0.01	0.0	0.00	0.00	0.0	0.01	0.00	0.0	0.14	0.06

19

VCUHEALTHSCI	GRID	40	FC	2825	VC	41585									
4	0.0	1.08	0.45	0.0	0.26	0.11	0.0	0.21	0.09	0.0	0.07	0.03	0.0	0.25	0.10
TOTAL	0.0	1.08	0.45	0.0	0.26	0.11	0.0	0.21	0.09	0.0	0.07	0.03	0.0	0.25	0.10

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ITTCONTINBAK	GRID	41	FC	2838	VC	41578									
4	0.13	0.13	0.13	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03
TOTAL	0.13	0.13	0.13	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03

21

CIRCLEWOODWK	GRID	42	FC	2877	VC	41595									
5	0.0	0.0	0.0	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.0	0.0	0.0

22

ALSEPAPERBYBG	GRID	44	FC	2841	VC	41568									
4	0.0	1.26	0.52	0.0	0.09	0.04	0.0	0.00	0.00	0.0	0.01	0.01	0.0	0.29	0.12
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.45	1.45	1.45	0.0	0.0	0.0
TOTAL	0.0	1.26	0.52	0.0	0.09	0.04	0.0	0.00	0.00	1.45	1.46	1.46	0.0	0.29	0.12

4	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.01	0.01
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.02	0.01	0.00	0.01	0.00	0.00	0.01	0.01

24

CRAWFORD MFG GRID 44 HC 2847 VC 41557

6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0
5	0.0	0.0	0.0	0.02	0.02	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.02	0.02	0.02	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01

25

FEDPAPSOTHRN GRID 44 HC 2848 VC 41559

4	1.91	1.91	1.91	0.09	0.09	0.09	0.00	0.00	0.00	0.01	0.01	0.01	0.29	0.29	0.29
TOTAL	1.91	1.91	1.91	0.09	0.09	0.09	0.00	0.00	0.00	0.01	0.01	0.01	0.29	0.29	0.29

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26

MILLER MFG GRID 44 HC 2845 VC 41553

5	0.0	0.0	0.0	0.41	0.41	0.41	0.03	0.03	0.03	0.03	0.03	0.03	0.15	0.15	0.15
TOTAL	0.0	0.0	0.0	0.41	0.41	0.41	0.03	0.03	0.03	0.03	0.03	0.03	0.15	0.15	0.15

27

MILHISERBAG GRID 46 HC 2877 VC 41550

4	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

28

PHILIPMCRRIS GRID 44 HC 2844 VC 41552

4	0.0	1.41	0.59	0.0	0.10	0.04	0.0	0.00	0.00	0.0	0.01	0.01	0.0	0.32	0.13
TOTAL	0.0	1.41	0.59	0.0	0.10	0.04	0.0	0.00	0.00	0.0	0.01	0.01	0.0	0.32	0.13

RICHMCGUANG GRID 44 HC 2844 VC 41574

TOTAL	C.OO	O.OO	O.CO	O.OZ	O.OZ	O.OZ	O.OO	C.OO	O.OO	O.OO	O.OO	O.OO	O.CI	O.Cl	C.OI
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VEPCOTWELFTH GRID 44 HC 2845 VC 41565

TOTAL	7.73	7.73	6.35	31.88	31.88	26.20	0.20	0.20	-0.17	0.06	0.06	0.05	3.66	3.66	3.01
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AMERTOBRICVA GRID 45 HC 2858 VC 41565

TOTAL:	0.0	3.10	1.28	0.0	0.98	0.41	0.0	0.94	0.39	0.0	0.28	0.12	0.0	0.62	0.26
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CRAWFCRCMFGC GRID 44 HC 2847 VC 41557

[illegible]

EASTERN SLEEP GRID 45 HC 2850 VC 41565

TOTAL	0.0	0.09	0.04	0.0	0.02	0.01	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.09	0.04
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IDEALFISHELT GRIC 45 FC 2857 VC 41565

[illegible]

TOTAL	0.01	0.01	0.01	35.31	35.31	35.31	0.00	0.00	0.00	0.01	0.01	0.01	0.08	0.08	0.08
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35

WESTVACO GRID 52 HC 2838 VC 41516

4	0.08	0.28	0.16	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.04
TOTAL	0.08	0.28	0.16	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.04

36

TIDWTRSTGRAV GRID 53 HC 2852 VC 41519

4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.0	0.0	0.0	0.14	0.14	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

37

BYRD RICHMOND GRID 55 HC 2947 VC 41535

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1	0.10	0.10	0.10	0.54	0.54	0.54	1.18	1.18	1.18	1.28	1.28	1.28	0.25	0.25	0.25
1	0.04	0.04	0.04	0.15	0.15	0.15	0.34	0.34	0.34	1.05	1.05	1.05	0.15	0.15	0.15
1	0.01	0.01	0.01	0.09	0.09	0.09	0.03	0.03	0.03	0.04	0.04	0.04	0.07	0.07	0.07
1	0.03	0.03	0.03	0.02	0.02	0.02	1.22	1.22	1.22	0.15	0.15	0.15	0.00	0.00	0.00
TOTAL	0.18	0.18	0.18	0.79	0.79	0.79	2.76	2.76	2.76	2.51	2.51	2.51	0.47	0.47	0.47

38

BCISE CASCADE GRID 55 HC 2929 VC 41525

4	0.0	0.05	0.02	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.01	0.00
TOTAL	0.0	0.05	0.02	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.01	0.00

39

DUPONT SPRUAN GRID 61 HC 2846 VC 41473

6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.07	3.07	3.07	0.0	0.0	0.0
5	11.10	11.10	11.10	0.15	0.15	0.15	0.0	0.0	0.0	0.68	0.68	0.68	0.0	0.0	0.0

40																
LAPUSNBROS	GRID	45	HC	2858	VC	41563										
4	0.0	0.01	0.01	0.0	0.03	0.01	0.0	0.03	0.01	0.0	0.01	0.00	0.0	0.02	0.01	
TOTAL	0.0	0.01	0.01	0.0	0.03	0.01	0.0	0.03	0.01	0.0	0.01	0.00	0.0	0.02	0.01	

41																
M+BHEADWEAR	GRID	45	HC	2859	VC	41562										
4	0.0	0.04	0.02	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.01	0.00	
TOTAL	0.0	0.04	0.02	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.01	0.00	

42																
REYNLCNGRSCU	GRID	45	HC	2843	VC	41556										
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.64	4.64	4.64	0.0	0.0	0.0	
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.64	4.64	4.64	0.0	0.0	0.0	

43																
MEDCCLLVIRGA	GRID	45	HC	2852	VC	41572										
4	0.0	1.34	0.56	0.0	0.43	0.18	0.0	0.21	0.09	0.0	0.06	0.03	0.0	0.21	0.09	
TOTAL	0.0	1.34	0.56	0.0	0.43	0.18	0.0	0.21	0.09	0.0	0.06	0.03	0.0	0.21	0.09	

44																
MILHISERBAG	GRID	46	HC	2877	VC	41550										
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	
TOTAL	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

45																
GREATANPTEAC	GRID	48	HC	2836	VC	41526										
4	0.10	0.10	0.10	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	
TOTAL	0.10	0.10	0.10	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

1-36

46	DAVID M LEA+CO	GRID	48	HC	2834	VC	41532									
4	0.17	0.17	0.17	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.04	
5	0.0	0.0	0.0	0.61	0.61	0.61	0.04	0.04	0.04	0.04	0.04	0.04	0.22	0.22	0.22	
TOTAL	0.17	0.17	0.17	0.62	0.62	0.62	0.05	0.05	0.05	0.05	0.05	0.05	0.26	0.26	0.26	

47	FEDPAPSEABRD	GRID	49	HC	2852	VC	41543									
4	1.64	1.64	1.64	3.80	3.80	3.80	0.10	0.10	0.10	0.05	0.05	0.05	0.72	0.72	0.72	
TOTAL	1.64	1.64	1.64	3.80	3.80	3.80	0.10	0.10	0.10	0.05	0.05	0.05	0.72	0.72	0.72	

48	CKFCUNDRY	GRID	49	HC	2852	VC	41540									
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5	0.0	0.0	0.0	0.03	0.03	0.03	0.23	0.23	0.23	0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL	0.00	0.00	0.00	0.03	0.03	0.03	0.23	0.23	0.23	0.00	0.00	0.00	0.00	0.00	0.00	

49	DIXIECONTANE	GRID	52	HC	2837	VC	41521									
4	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	
TOTAL	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	

50	DLPONTSPRUAN	GRID	61	HC	2846	VC	41473									
4	14.84	14.84	14.84	55.44	55.44	55.44	0.39	0.39	0.39	0.12	0.12	0.12	6.96	6.96	6.96	
TOTAL	25.94	25.94	25.94	55.59	55.59	55.59	0.39	0.39	0.39	3.87	3.87	3.87	6.96	6.96	6.96	

51	GENSHALEPRCD	GRID	52	HC	2842	VC	41514									
4	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.08	0.08	0.08	

TOTAL	0.01	0.01	0.01	35.31	35.31	35.31	0.00	0.00	0.00	0.01	0.01	0.01	0.08	0.08
52														
WESTVACO	GRID	52	HC	2838	VC	41516								
4	0.08	0.28	0.16	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04
TOTAL	0.08	0.28	0.16	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04
53														
TIDTRSTGRAV	GRID	53	HC	2852	VC	41519								
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.0	0.0	0.14	0.14	0.14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
54														
BYRD RICHMOND	GRID	55	HC	2947	VC	41535								
1	0.10	0.10	0.10	0.54	0.54	0.54	1.18	1.18	1.18	1.28	1.28	1.28	0.25	0.25
1	0.04	0.04	0.04	0.15	0.15	0.15	0.34	0.34	0.34	1.05	1.05	1.05	0.15	0.15
1	0.01	0.01	0.01	0.09	0.09	0.09	0.03	0.03	0.03	0.04	0.04	0.04	0.07	0.07
1	0.03	0.03	0.03	0.02	0.02	0.02	1.22	1.22	1.22	0.15	0.15	0.15	0.00	0.00
TOTAL	0.18	0.18	0.18	0.79	0.79	0.79	2.76	2.76	2.76	2.51	2.51	2.51	0.47	0.47
55														
BCISECASCAD	GRID	55	HC	2929	VC	41529								
4	0.0	0.05	0.02	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
TOTAL	0.0	0.05	0.02	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
56														
DUPONT SPA	GRID	61	HC	2846	VC	41473								
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.07	3.07	0.0	0.0	0.0
5	11.19	11.10	11.10	0.15	0.15	0.15	0.0	0.0	0.0	0.68	0.68	0.0	0.0	0.0

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR



TOTAL	25.94	25.94	25.94	55.59	55.59	55.59	0.39	0.39	0.39	3.87	3.87	3.87	6.96	6.96	6.96
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57															
BELLWCCD	GRID 63			HC	2840	VC	41440								
4	0.0	0.90	0.37	0.0	0.22	0.09	0.0	0.15	0.06	0.0	0.05	0.02	0.0	0.18	0.07
8	0.01	0.01	0.01	0.07	0.07	0.07	0.10	0.10	0.10	0.07	0.07	0.07	0.01	0.01	0.01
TOTAL	0.01	0.91	0.38	0.07	0.29	0.16	0.10	0.25	0.16	0.07	0.12	0.10	0.01	0.19	0.08

58															
DUPONTJIMRVR	GRID 64			HC	2867	VC	41487								
5	4.33	4.33	4.33	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	4.33	4.33	4.33	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

59															
REYNLCBELLWD	GRID 64			HC	2865	VC	41406								
4	0.08	0.08	0.08	0.02	0.02	0.02	0.00	0.00	0.00	0.02	0.02	0.02	0.14	0.14	0.14
TOTAL	0.08	0.08	0.08	0.02	0.02	0.02	0.00	0.00	0.00	0.02	0.02	0.02	0.14	0.14	0.14

60															
STNDADPAPER	GRID 64			HC	2865	VC	41422								
4	0.07	0.25	0.15	0.03	0.11	0.06	0.00	0.00	0.00	0.01	0.02	0.01	0.15	0.50	0.30
TOTAL	0.07	0.25	0.15	0.03	0.11	0.06	0.00	0.00	0.00	0.01	0.02	0.01	0.15	0.50	0.30

61															
AEC FCUNDRY	GRID 67			HC	2875	VC	41366								
5	0.0	0.0	0.0	0.00	0.00	0.00	0.04	0.04	0.04	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.00	0.00	0.00	0.04	0.04	0.04	0.0	0.0	0.0	0.0	0.0	0.0

62															
VEPCOCHESTER	GRID 67			HC	2890	VC	41397								
4	249.34	249.34	204.94	348.23	348.23	286.22	2.22	2.22	1.82	3.03	3.03	2.49	89.33	89.33	73.42

63

AMERTCHHAMR GRID 69 HC 2941 VC 41350

4	0.0	4.22	1.75	0.0	0.31	0.13	0.0	0.00	0.00	0.0	0.04	0.02	0.0	0.96	0.40
TOTAL	0.0	4.22	1.75	0.0	0.31	0.13	0.0	0.00	0.00	0.0	0.04	0.02	0.0	0.96	0.40

64

CCNINENTCAN GRID 71 HC 2991 VC 41307

4	15.90	15.90	15.90	1.15	1.15	1.15	0.01	0.01	0.01	0.15	0.15	0.15	3.60	3.60	3.60
5	0.0	0.0	0.0	0.45	0.45	0.45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	15.90	15.90	15.90	1.60	1.60	1.60	0.01	0.01	0.01	0.15	0.15	0.15	3.60	3.60	3.60

65

FIRESYNTHFIB GRID 71 HC 2972 VC 41300

4	2.61	2.61	2.61	0.13	0.13	0.13	0.00	0.00	0.00	0.02	0.02	0.02	0.39	0.39	0.39
5	0.0	0.0	0.0	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.0	0.0	0.0
TOTAL	2.61	2.61	2.61	0.13	0.13	0.13	0.01	0.01	0.01	0.02	0.02	0.02	0.39	0.39	0.39

66

ALIOCHEMPLAS GRID 71 HC 2979 VC 41303

4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01

67

SCUTHYTLDALE GRID 76 HC 2771 VC 41198

5	0.0	0.0	0.0	0.19	0.19	0.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.19	0.19	0.19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

68

ROYWDAVIS GRID 76 HC 2708 VC 41207

5	0.00	0.00	0.00	0.30	0.30	0.30	1.95	1.95	1.95	0.16	0.16	0.16	0.01	0.01	0.01
TOTAL	0.00	0.00	0.00	0.30	0.30	0.30	1.95	1.95	1.95	0.16	0.16	0.16	0.01	0.01	0.01

69

CCLHGT DUMP GRID 78 HC 2682 VC 41260

9	0.02	0.02	0.02	0.26	0.26	0.26	1.37	1.37	1.37	0.48	0.48	0.48	0.10	0.10	0.10
TOTAL	0.02	0.02	0.02	0.26	0.26	0.26	1.37	1.37	1.37	0.48	0.48	0.48	0.10	0.10	0.10

70

HERCULES GRID 80 HC 2980 VC 41290

4	11.57	11.57	11.57	16.49	16.49	16.49	0.28	0.28	0.28	0.20	0.20	0.20	3.49	3.49	3.49
5	0.60	0.60	0.60	0.24	0.24	0.24	0.0	0.0	0.0	4.07	4.07	4.07	0.0	0.0	0.0
TOTAL	12.17	12.17	12.17	16.73	16.73	16.73	0.28	0.28	0.28	4.27	4.27	4.27	3.49	3.49	3.49

71

1-41 CNTRLHOSPITAL GRID 81 HC 2825 VC 41210

4	0.0	1.24	0.52	0.0	0.43	0.18	0.0	0.07	0.03	0.0	0.04	0.02	0.0	0.55	0.23
TOTAL	0.0	1.24	0.52	0.0	0.43	0.18	0.0	0.07	0.03	0.0	0.04	0.02	0.0	0.55	0.23

72

PETERSBRGDMP GRID 82 HC 2881 VC 41232

9	0.04	0.04	0.04	0.61	0.61	0.61	3.25	3.25	3.25	1.15	1.15	1.15	0.23	0.23	0.23
TOTAL	0.04	0.04	0.04	0.61	0.61	0.61	3.25	3.25	3.25	1.15	1.15	1.15	0.23	0.23	0.23

73

SEWARDLUGGAG GRID 84 HC 2860 VC 41222

4	0.0	0.07	0.03	0.0	0.04	0.01	0.0	0.16	0.07	0.0	0.04	0.01	0.0	0.01	0.00
5	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
TOTAL	0.0	0.07	0.03	0.00	0.04	0.02	0.0	0.16	0.07	0.0	0.04	0.01	0.00	0.01	0.00

4	0.0	0.63	0.26	0.0	0.10	0.04	0.0	0.00	0.00	0.0	0.03	0.01	0.0	0.35	0.14
TOTAL	0.0	0.63	0.26	0.0	0.10	0.04	0.0	0.00	0.00	0.0	0.03	0.01	0.0	0.35	0.14

75

FCRT LEE GRID 86 FC 2928 VC 41234

4	0.0	1.45	0.60	0.0	0.56	0.23	0.0	0.03	0.01	0.0	0.03	0.01	0.0	1.14	0.47
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8	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
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6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.74	0.74	0.74	0.0	0.0	0.0
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TOTAL	0.0	1.45	0.60	0.00	0.57	0.24	0.0	0.03	0.01	0.74	0.78	0.76	0.00	1.14	0.47
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76

FJWILLIAMSNS GRID 87 HC 297C VC 41214

5	0.0	0.0	0.0	0.00	0.00	0.00	0.03	0.03	0.03	0.0	0.0	0.0	0.0	0.0	0.0
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TOTAL	0.0	0.0	0.0	0.00	0.00	0.00	0.03	0.03	0.03	0.0	0.0	0.0	0.0	0.0	0.0
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I-42

77

RICHARDBLAND GRID 89 FC 2872 VC 41148

4	0.0	0.05	0.02	0.0	0.01	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.02	0.01
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TOTAL	0.0	0.05	0.02	0.0	0.01	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.02	0.01
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78

BRENCOINC GRID 90 FC 2910 VC 41190

4	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02
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8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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5	0.0	0.0	0.0	0.25	0.25	0.25	2.17	2.17	2.17	0.0	0.0	0.0	0.0	0.0	0.0
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TOTAL	0.01	0.01	0.01	0.25	0.25	0.25	2.17	2.17	2.17	0.00	0.00	0.00	0.02	0.02	0.02
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79

MASCNITEGRP GRID 97 FC 3141 VC 41098



POINT SOURCE EMISSIONS BY PLANT  
TONS PER DAY

SCX			PART			CC			HC			NOX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
85														
BASICOCONSTRU			GRID 4			FC 3445			VC 41337					
TYPE 4	0.0	0.51	0.16	0.0	0.03	0.1	0.0	0.0	0.0	0.00	0.10	0.0	0.09	0.03
TYPE 5	0.0	0.0	0.1	0.47	0.47	0.47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.51	0.16	0.47	0.50	0.48	0.0	0.0	0.0	0.00	0.10	0.0	0.09	0.03
86														
CLYDECOAL			GRID 4			FC 344			VC 41349					
TYPE 4	0.0	0.01	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.00
TYPE 5	0.0	0.0	0.0	1.71	1.71	1.71	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.0
TOTAL	0.0	0.01	0.01	1.71	1.71	1.71	0.0	0.0	0.0	0.00	0.00	0.0	0.00	0.00
87														
SYNTHETEX			GRID 4			FC 3458			VC 41342					
TYPE 4	0.0	0.07	0.02	0.0	0.01	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.02	0.01
TYPE 0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00
TYPE 5	0.0	0.0	0.0	0.01	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.0
TOTAL	0.00	0.07	0.02	0.0	0.01	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.02	0.01
88														
SHELDONLUCCM			GRID 4			FC 3411			VC 41392					
TYPE 5	0.21	0.21	0.21	1.93	1.93	1.93	0.14	0.14	0.14	0.14	0.14	0.71	0.71	0.71
TOTAL	0.21	0.21	0.21	1.93	1.93	1.93	0.14	0.14	0.14	0.14	0.14	0.71	0.71	0.71
89														
SHELDONWOOD			GRID 4			FC 3477			VC 41394					
TYPE 5	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

REPRODUCIBILITY OF THE  
ORIGINAL PAPER IS POOR

		SCX		PART		CD		HC		NOX						
		S	W	S	W	S	W	S	W	S	W	S	W			
90																
DAILY PRESS		GRID	34	FC	37.9	VC	4.975									
TYPE	4	0.0	1.92	0.81	0.0	0.50	0.16	0.39	0.12	0.0	0.12	0.14	0.0	0.23	0.07	
TOTAL	0.0	1.92	0.81	0.0	0.51	0.16	0.0	0.39	0.12	0.0	0.12	0.14	0.0	0.24	0.07	
91																
NAVAL SUPPLY B		GRID	11	FC	3583	VC	4128									
TYPE	4	0.0	0.56	0.18	0.0	0.18	0.06	0.13	0.04	0.0	0.04	0.01	0.0	0.21	0.07	
TOTAL	0.0	0.56	0.18	0.0	0.18	0.06	0.0	0.13	0.04	0.0	0.04	0.01	0.0	0.21	0.07	
92																
CCLLGEMMARY		GRID	13	FC	348	VC	4126									
TYPE	4	0.0	3.12	0.99	0.0	0.18	0.06	0.0	0.02	0.01	0.0	0.01	0.0	0.56	0.18	
TOTAL	0.0	3.12	0.99	0.0	0.18	0.06	0.0	0.0	0.02	0.01	0.0	0.01	0.0	0.56	0.18	
93																
JAMESTN FCLND		GRID	14	FC	3408	VC	4121									
TYPE	4	0.0	0.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.00	
TOTAL	0.0	0.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.00	
94																
NAVAL WEAPNS		GRID	19	FC	3630	VC	4122									
TYPE	4	0.0	3.70	1.18	0.0	0.40	0.13	0.0	0.07	0.02	0.0	0.02	0.0	1.08	0.34	
TOTAL	0.0	3.70	1.18	0.0	0.40	0.13	0.0	0.0	0.07	0.02	0.0	0.02	0.0	1.08	0.34	
95																
DCWRADISCHE		GRID	22	FC	3575	VC	41174									
TYPE	4	4.86	6.11	5.23	0.28	0.25	0.2	0.0	0.0	0.0	0.04	0.05	0.04	0.88	1.09	0.95
TYPE	9	0.00	0.00	0.00	0.0	0.0	0.0	0.04	0.04	0.04	0.11	0.11	0.11	0.01	0.01	0.01
TYPE	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.67	1.67	1.67	0.0	0.0	0.0

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

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REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

TOTAL 4.87 6.02 5.23 1.28 1.35 0.3 1.14 1.4 1.74 1.82 1.83 1.82 0.89 1.10 0.96

0031

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR



		SPX			PART			CD			HC			NOX		
		S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
96																
FT EUSTIS		GRID 22			PC 3610			VC 4114								
TYPE	4	1.0	5.93	1.88	1.25	1.4		1.78	1.25	1.2	1.28	1.09	1.0	1.69	0.54	
TOTAL		1.0	5.93	1.88	1.25	1.4		1.78	1.25	1.2	1.28	1.09	1.0	1.69	0.54	
97																
FT EUSTIS AP		GRID 22			PC 3610			VC 4114								
TYPE	1	0.36	0.36	0.36	2.14	2.14	2.14	1.71	1.71	1.71	1.07	1.07	1.07	1.78	1.78	1.78
TYPE	1	0.76	0.76	0.76	1.91	1.91	1.91	115.89	115.89	115.89	15.3	15.3	15.3	0.15	0.15	0.15
TOTAL		1.12	1.12	1.12	4.05	4.05	4.05	116.60	116.60	116.60	16.37	16.37	16.37	1.93	1.93	1.93
98																
NEWPORT INCIN		GRID 27			PC 3668			VC 4172								
TYPE	7	0.14	0.14	0.14	1.34	1.34	1.34	0.1	0.1	0.1	0.14	0.14	0.14	0.19	0.19	0.19
TOTAL		0.14	0.14	0.14	1.34	1.34	1.34	0.1	0.1	0.1	0.14	0.14	0.14	0.19	0.19	0.19
99																
VASSCAREPCA		GRID 27			PC 3682			VC 4177								
TYPE	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.00	
TOTAL		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.00	
100																
LASIOCCNSTRU		GRID 27			PC 3698			VC 4175								
TYPE	4	0.01	0.01	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.01	0.01	0.01
TYPE	5	0.0	0.0	0.0	0.22	0.22	0.22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL		0.01	0.01	0.01	0.23	0.23	0.23	0.0	0.0	0.0	0.00	0.00	0.00	0.01	0.01	0.01

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SFX			PART			CC			FC			NOX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
101														
CHNEWPORTCCL			GPIC	27		FC	3675		VC	41.27				
TYPE	4	0.0	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.01
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.01

102														
BWMILRCCNTR			GPIC	27		FC	3678		VC	41.61				
TYPE	4	0.0	0.28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.06	0.02
TYPE	5	0.0	0.0	0.0	0.50	0.50	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.28	0.0	0.50	0.50	0.51	0.0	0.0	0.0	0.0	0.0	0.0	0.06	0.02

103														
PATRICKHENRY			GPIC	27		FC	3655		VC	41.48				
TYPE	1	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.00	0.00	0.00
TYPE	1	0.41	0.41	0.41	1.44	1.44	1.44	3.28	3.28	3.28	10.25	10.25	1.44	1.44
TYPE	1	0.01	0.01	0.01	0.04	0.04	0.04	0.01	0.01	0.01	0.02	0.02	0.04	0.04
TYPE	1	0.54	0.54	0.54	0.54	0.54	0.54	32.71	32.71	32.71	4.12	4.12	0.07	0.07
TOTAL	0.95	0.95	0.95	2.03	2.03	2.03	26.03	26.03	26.03	14.42	14.42	14.42	1.55	1.55

104														
TRCNELSWCCMC			GPIC	28		FC	3733		VC	41.29				
TYPE	4	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.00
TOTAL	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.00

105														
LANGLEY NASA			GPIC	28		FC	3791		VC	41.50				
TYPE	1	0.17	0.07	0.07	0.26	0.26	0.26	0.58	0.58	0.58	1.82	1.82	0.26	0.26
TYPE	1	0.12	0.12	0.12	0.73	0.73	0.73	0.24	0.24	0.24	0.36	0.36	0.61	0.61
TOTAL	0.19	0.19	0.19	0.98	0.98	0.98	0.83	0.83	0.83	2.15	2.15	2.19	0.86	0.86

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

SEX		PART		CC		HC		NOX	
S	A	S	A	S	A	S	A	S	A

106

LANGLEYNASA GRID 28 FC 3810 VC 4114

TYPE 4	0.0	2.01	6.36	0.0	1.75	0.56	0.0	0.02	0.01	0.0	0.25	0.08	0.0	6.08	0.93
TOTAL	0.0	2.01	6.36	0.0	1.75	0.56	0.0	0.02	0.01	0.0	0.25	0.08	0.0	6.08	0.93

107

KIRKLUMBERCC GRID 32 FC 3541 VC 4.914

TYPE 5	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
TOTAL	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01

108

DUXICORPERA GRID 24 FC 3743 VC 41961

TYPE 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

109

CCATSANDCLAR GRID 34 FC 3722 VC 41962

TYPE 4	0.00	0.09	0.03	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01
TYPE 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TYPE 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.00	0.09	0.03	0.00	0.01	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01

110

DAILYPRESS GRID 34 FC 3719 VC 41975

TYPE 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

REPRODUCIBILITY OF THIS  
ORIGINAL PAGE IS POOR

SOX			PART			GC			HC			NOX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
111														
NAVALYARINE			GRID	34	FC	3711	VC	41971						
TYPE	4	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00

112											
HAMPTONPAINT		GRID	36	FC	3757	VC	41988				
TYPE 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01	0.01	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01	0.01	0.0

113											
CLYDEWELSP		GRID	36	FC	3757	VC	41995				
TYPE 4	0.0	0.04	0.01	0.0	0.02	0.01	0.0	0.00	0.00	0.00	0.07
TYPE 5	0.0	0.0	0.0	0.14	0.14	0.14	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.04	0.01	0.14	0.16	0.14	0.0	0.00	0.00	0.00	0.07

114											
PENASPHALTPA		GRID	39	FC	3766	VC	41968				
TYPE 4	0.0	0.03	0.01	0.0	0.01	0.01	0.0	0.00	0.00	0.00	0.04
TYPE 5	0.0	0.0	0.0	0.16	0.16	0.16	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.03	0.01	0.16	0.17	0.16	0.0	0.00	0.00	0.00	0.04

115											
MAIDAEVELCA		GRID	41	FC	3817	VC	40986				
TYPE 5	0.0	0.0	0.0	0.01	0.01	0.01	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.00	0.00	0.01	0.01	0.01	0.0	0.00	0.00	0.00	0.00

REPRODUCTION OF THIS  
ORIGINAL PAGE IS POOR

SEX			PART			CC			HC			NDX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
116														
SCHTHRMATRH GRID 41 HC 3796 VC 4972														
TYPE 4	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

117														
HASPAYTELEDY GRID 41 HC 3807 VC 4971														
TYPE 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

118														
MAIDACEVELCA GRID 41 HC 3817 VC 4996														
TYPE 4	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TYPE 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.07	0.07	0.07	0.0	0.0	0.0
TOTAL	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.07	0.07	0.0	0.00	0.00

119														
MAIDACEVEICR GRID 41 HC 3824 VC 4974														
TYPE 4	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TYPE 5	0.0	0.0	0.0	0.27	0.27	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.0	0.00	0.00	0.27	0.27	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

120														
CCLUMROPECCH GRID 45 HC 3725 VC 4932														
TYPE 4	0.0	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
TOTAL	0.0	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00



SRC			PART			CC			HC			NDX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
121														
ARKELSAFE2AG GRID 45 HC 3749 VC 41626														
TYPE 4	0.14	0.24	0.17	0.01	0.02	0.11	0.01	0.01	0.01	0.03	0.00	0.04	0.07	0.05
TOTAL	0.14	0.24	0.17	0.01	0.02	0.11	0.00	0.00	0.00	0.03	0.00	0.04	0.07	0.05

122														
MICACDFCANAD GRID 48 HC 3741 VC 41922														
TYPE 4	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01
TYPE 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TYPE 5	0.0	0.0	0.0	0.01	0.01	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01

123														
ASHEVILEMICA GRID 48 HC 3735 VC 41919														
TYPE 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

124														
SEWELLSOENPL GRID 51 HC 3941 VC 41911														
TYPE 4	0.0	41.99	13.34	0.0	3.14	1.0	0.0	0.07	0.02	0.0	0.42	0.13	0.0	9.83
TOTAL	0.0	41.99	13.34	0.0	3.14	1.0	0.0	0.07	0.02	0.0	0.42	0.13	0.0	9.83

125														
NAVALSUPPLYA GRID 54 HC 3821 VC 41981														
TYPE 4	0.0	1.18	0.37	0.0	0.09	0.13	0.0	0.01	0.00	0.0	0.01	0.00	0.0	0.08
TOTAL	0.0	1.18	0.37	0.0	0.09	0.13	0.0	0.01	0.00	0.0	0.01	0.00	0.0	0.08



SCX			PART			CO			HC			NCX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A

126

SEFLERCLCRE GRID 55 FC 3825 VC 4'882

TYPE 4	0.25	0.19	0.09	0.01	0.05	0.03	0.01	0.06	0.03	0.00	0.02	0.01	0.01	0.03	0.02
TOTAL	0.25	0.19	0.09	0.01	0.05	0.03	0.01	0.06	0.03	0.00	0.02	0.01	0.01	0.03	0.02

127

NAVALAMPBUS GRID 50 FC 3962 VC 40865

TYPE 4	0.00	10.64	3.38	0.00	0.78	0.25	0.00	0.01	0.00	0.00	0.10	0.13	0.00	2.46	0.78
TOTAL	0.00	10.64	3.38	0.00	0.78	0.25	0.00	0.01	0.00	0.00	0.10	0.13	0.00	2.46	0.78

128

NCRFOLKREGNL GRID 56 FC 3882 VC 40860

TYPE 1	0.02	0.02	0.02	0.14	0.14	0.14	0.30	0.30	0.30	0.32	0.32	0.32	0.06	0.06	0.06
TYPE 1	0.13	0.13	0.13	0.45	0.45	0.45	1.03	1.03	1.03	3.23	3.23	3.23	0.45	0.45	0.45
TYPE 1	0.01	0.01	0.01	0.07	0.07	0.07	0.02	0.02	0.02	0.03	0.03	0.03	0.06	0.06	0.06
TYPE 1	0.28	0.28	0.28	0.28	0.28	0.28	17.16	17.16	17.16	2.16	2.16	2.16	0.04	0.04	0.04
TOTAL	0.45	0.45	0.45	0.94	0.94	0.94	18.51	18.51	18.51	5.74	5.74	5.74	0.61	0.61	0.61

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REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

129

FT STORY GRID 69 FC 4100 VC 40870

TYPE 4	0.00	0.46	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.12
TOTAL	0.00	0.46	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.12

130

TIDEWIRCOMCL GRID 70 FC 372 VC 4.85

TYPE 4	0.00	0.82	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.06
TOTAL	0.00	0.82	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.06

S SCX W A S PAPT W A S CO W A S HC W A S NGX W A

131

ACRECKINCIA GRIC 74 FC 5828 VC 40826

TYPE 7 0.16 0.16 0.16 1.49 1.49 1.49 0.11 0.11 0.11 0.16 0.16 0.16 0.21 0.21 0.21

TOTAL 0.16 0.16 0.16 1.49 1.49 1.49 0.11 0.11 0.11 0.16 0.16 0.16 0.21 0.21 0.21

132

VATPUCKCRNAM GRIC 77 FC 3548 VC 40844

TYPE 4 0.0 0.03 0.11 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

TOTAL 0.0 0.03 0.11 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

133

SCUTHRMATRE GRIC 84 FC 3812 VC 40874

TYPE 4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

TOTAL 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

134

HIGHSICECPEA GRIC 85 FC 3828 VC 40922

TYPE 4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

TYPE 8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

TOTAL 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

135

CWENPATTERN GRIC 85 FC 3845 VC 40812

TYPE 4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

TYPE 5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

TOTAL 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

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SCX			PART			CG			HC			NOX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A

136

LNICACARBIDE GRID 85 FC 3838 VC 41823

TYPE 4	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00
TOTAL	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00

137

ATFURNMFGCO GRID 86 FC 3855 VC 41848

TYPE 4	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00
TOTAL	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00

138

BAKERSHETMET GRID 87 FC 3885 VC 41916

TYPE 4	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00
TOTAL	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00

139

GENFOAMANFLA GRID 87 FC 3892 VC 40802

TYPE 4	0.0	0.01	0.00	0.0	0.01	0.00	0.0	0.01	0.00	0.0	0.01	0.00	0.0	0.01	0.00
TOTAL	0.0	0.01	0.00	0.0	0.01	0.00	0.0	0.01	0.00	0.0	0.01	0.00	0.0	0.01	0.00

140

2CYAL SILVER GRID 87 FC 3888 VC 41822

TYPE 4	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00

141

CCLCNIALHLEC GRID 87 FC 3888 VC 41823

TYPE 4	0.01	0.02	0.01	0.01	0.01	0.01	0.0	0.01	0.02	0.01	0.01	0.00	0.01	0.02	0.01
TYPE 5	0.0	0.0	0.0	0.01	0.01	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.01	0.02	0.01	0.01	0.01	0.01	0.0	0.01	0.02	0.01	0.01	0.00	0.01	0.02	0.01

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SCX		PAPT		CC		HC		NCX							
S	A	S	W	A	S	W	A	S	W	A					
142															
SHAPTINGCOREM		GRID	99	FC	2980	VC	4.67								
TYPE	4	0.02	0.64	0.20	0.0	0.17	0.05	0.0	0.13	0.04	0.01	0.0	0.08	0.02	
TOTAL	...	0.0	0.64	0.20	...	0.0	0.17	0.05	0.0	0.13	0.04	0.01	0.0	0.08	0.02

143																			
COLUMBIAYACK				CPID	98	FC	3812	VC	4.79										
TYPE	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
TYPE	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.0	0.0	0.0			
TYPE	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
TOTAL		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.34	0.34	0.34	0.0	0.0	0.0			

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144																
GAPACIFICPAP																
GRID 78 HC 38.9 VC 4.792																
TYPE	5	0.06	0.06	0.06	0.5	0.5	0.5	0.4	0.4	0.4	0.15	0.15	0.15	0.19	0.19	0.19
TOTAL		0.06	0.06	0.06	0.5	0.5	0.5	0.4	0.4	0.4	0.15	0.15	0.15	0.19	0.19	0.19

145														
STARBOARD		GRID		95	FC	38.9	VC	4.793						
TYPE	4	0.00	0.00	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
TYPE	8	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00
TYPE	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0
TOTAL		0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00

146														
DIXIEWEGCC		GRID	99	HC	3826	VC	4.797							
TYPE	4	0.04	0.07	0.05	0.01	0.02	0.01	0.01	0.02	0.01	0.00	0.01	0.01	0.01
TYPE	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TYPE	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		0.04	0.07	0.05	0.01	0.02	0.01	0.01	0.02	0.01	0.00	0.01	0.01	0.01

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SCX			PART			CO			HC			NOX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
147														
NAVALHOSPITAL			GRID 99			FC 3836			VC 4072					
TYPE 4	0.0	2.13	0.68	0.0	0.22	0.07	0.0	0.07	0.02	0.0	0.05	0.02	0.0	0.74
TOTAL	0.0	2.13	0.68	0.0	0.22	0.07	0.0	0.07	0.02	0.0	0.05	0.02	0.0	0.74

148														
NCRFCKINCNR			GRID 10			FC 3852			VC 40788					
TYPE 7	0.05	0.05	0.15	0.5	0.5	0.5	0.04	0.04	0.04	0.05	0.05	0.05	0.07	0.07
TOTAL	0.05	0.05	0.15	0.5	0.5	0.5	0.04	0.04	0.04	0.05	0.05	0.05	0.07	0.07

149														
MARSHAL STEEL			GRID 1			FC 3855			VC 40781					
TYPE 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

150														
LARKMARKCCMV			GRID 10			FC 3852			VC 40794					
TYPE 4	0.0	0.02	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04	0.01
TYPE 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.02	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04	0.01

151														
SLUTHPAMATPE			GRID 10			FC 3875			VC 40779					
TYPE 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

152														
BIRSCHCCNCCM			GRID 10			FC 3878			VC 40781					
TYPE 4	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
TYPE 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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SCX			PART			CO			HC			NOX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
153														
AMESANNWBRCC			GRID 101			HC 3889			VC 40791					
TYPE 4	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.01	0.01	0.01
TYPE 5	0.0	0.0	0.0	5.00	5.00	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.05	0.05	0.05	5.00	5.00	5.00	0.0	0.0	0.0	0.0	0.0	0.01	0.01	0.01

154											
SCUTBLOCKPIP		GRID 101		HC 3891		VC 40788					
TYPE 4	0.01	0.13	0.05	0.00	0.1	0.0	0.00	0.00	0.00	0.00	0.00
TOTAL	0.01	0.13	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00

155											
CCNIPAVING		GRID 103		HC 3989		VC 40769					
TYPE 4	0.0	0.07	0.02	0.0	0.0	0.01	0.0	0.00	0.0	0.0	0.0
TYPE 5	0.0	0.0	0.0	2.28	2.28	2.29	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.07	0.02	2.28	2.31	2.29	0.0	0.0	0.0	0.0	0.0

156											
ASPHALTROADS		GRID 103		HC 3974		VC 40775					
TYPE 4	0.0	0.81	0.26	0.0	0.5	0.1	0.0	0.00	0.0	0.0	0.0
TYPE 5	0.0	0.0	0.0	4.79	4.79	4.79	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.81	0.26	4.79	4.84	4.90	0.0	0.0	0.0	0.0	0.0

157											
SOUTHKNMTRC		GRID 103		HC 4000		VC 40780					
TYPE 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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SCX			PART			CC			HC			NOX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A

158

FINLEYPAVING GRID 106 FC 4102 VC 4772

TYPE 4	0.0	0.53	0.17	0.0	0.13	0.11	0.0	0.00	0.00	0.00	0.00	0.00	0.10	0.03
TYPE 5	0.0	0.0	0.0	0.97	0.97	0.97	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.53	0.17	0.97	10.00	0.08	0.0	0.00	0.00	0.00	0.00	0.00	0.10	0.03

159

PORTSMOUTHACN GRID 109 FC 3812 VC 4762

TYPE 7	0.10	0.10	0.10	0.96	0.96	0.96	0.07	0.07	0.07	0.10	0.10	0.10	0.14	0.14
TOTAL	0.10	0.10	0.10	0.96	0.96	0.96	0.07	0.07	0.07	0.10	0.10	0.10	0.14	0.14

160

SCULHNNATPA GRID 109 FC 3817 VC 4763

TYPE 4	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

161

NCFCKNAVSHIP GRID 111 FC 3840 VC 4751

TYPE 4	0.0	20.50	0.08	0.0	2.07	0.06	0.0	0.2	0.1	0.0	0.27	0.09	0.0	6.48
TOTAL	0.0	20.59	0.08	0.0	2.07	0.06	0.0	0.2	0.1	0.0	0.27	0.09	0.0	6.48

162

NCFOLKSHIP GRID 111 FC 3860 VC 4751

TYPE 4	1.70	-0.69	0.94	1.1	-0.04	0.5	0.0	-0.0	0.0	0.01	-0.01	0.01	0.31	-0.13
TYPE 5	0.0	0.0	0.0	1.11	1.11	1.11	0.0	0.0	0.0	0.0	0.0	0.0	1.11	1.11
TOTAL	1.70	-0.69	0.94	1.21	1.07	1.16	0.0	-0.0	0.0	0.01	-0.01	0.01	1.42	0.98

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SCX			PORT			CO			PC			NOX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A

163

RICHARDECLMD GRID 111 FC 3864 VC 4.768

TYPE 5	0.0	0.0	0.0	0.55	0.55	0.55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.55	0.55	0.55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

164

CAPCONCRETE GRID 111 FC 3858 VC 4.772

TYPE 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

165

COLCNASSHPY GRID 111 FC 3863 VC 4.772

TYPE 4	0.01	0.03	0.01	0.01	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.01	0.03	0.01	0.01	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

166

ECFDMCTORCO GRID 111 FC 4827 VC 4.771

TYPE 4	0.14	0.14	0.14	0.4	0.4	0.4	0.0	0.0	0.0	0.01	0.01	0.01	0.12	0.12	0.12
TYPE 8	0.00	0.00	0.0	0.01	0.1	0.1	0.01	0.1	0.1	0.01	0.01	0.01	0.00	0.00	0.00
TYPE 5	0.0	0.0	0.0	0.02	0.2	0.2	0.0	0.0	0.0	2.83	2.83	2.83	0.0	0.0	0.0
TOTAL	0.14	0.14	0.14	0.7	0.7	0.7	0.1	0.1	0.1	2.84	2.84	2.84	0.12	0.12	0.12

167

DERECKKINACNO GRID 112 FC 3888 VC 4.764

TYPE 8	0.02	0.02	0.02	0.22	0.22	0.22	0.37	0.37	0.37	0.11	0.11	0.11	0.37	0.37	0.37
TOTAL	0.02	0.02	0.02	0.22	0.22	0.22	0.37	0.37	0.37	0.11	0.11	0.11	0.37	0.37	0.37

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		SCX			PART			CC			HC			NOX		
		S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
-----																
168																
SCUTLANDCCR		GRID 112			FC 3887			VC 4767								
TYPE	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TYPE	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.23	0.23	0.23	0.0	0.0	0.0
TYPE	5	0.0	0.0	0.0	0.68	0.68	0.68	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL		0.00	0.00	0.00	0.69	0.69	0.69	0.00	0.00	0.00	0.23	0.23	0.23	0.00	0.00	0.00

169																
WTCREASOTING		GRID 117			FC 2836			VC 40742								
TYPE	4	0.26	0.26	0.26	0.01	0.01	0.01	0.0	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05
TYPE	5	0.79	0.79	0.79	0.14	0.14	0.14	0.53	0.53	0.53	0.53	0.53	0.53	2.60	2.60	2.60
TOTAL		1.05	1.05	1.05	0.16	0.16	0.16	0.53	0.53	0.53	0.53	0.53	0.53	2.65	2.65	2.65

170																
JEWILSONCCPP		GRID 117			FC 3842			VC 40746								
TYPE	4	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.02	0.00
TYPE	9	0.00	0.00	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00

171																
PCPTSMCTHPLV		GRID 117			FC 5827			VC 47748								
TYPE	4	0.0	0.34	0.11	0.0	0.02	0.01	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.06	0.02
TYPE	5	0.0	0.0	0.0	6.77	6.77	6.77	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL		0.00	0.34	0.11	6.77	6.79	6.78	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.06	0.02

172																
NCRYVENPMILS		GRID 117			FC 3842			VC 47748								
TYPE	4	0.15	0.16	0.16	0.12	0.12	0.12	0.1	0.01	0.01	0.0	0.00	0.00	0.06	0.06	0.06
TYPE	5	0.11	0.11	0.11	1.10	1.10	1.10	0.09	0.09	0.09	0.11	0.11	0.11	0.35	0.35	0.35
TOTAL		0.26	0.27	0.27	1.22	1.22	1.22	0.1	0.1	0.1	0.11	0.11	0.11	0.41	0.41	0.41





SCX			PART			CC			HC			NOX			
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A	
173															
LCNESTARCEM			GRID 118			FC 3850			VC 4748						
TYPE 4	6.81	-12.48	0.68	6.80	-16.12	0.98	0.45	-1.82	0.04	1.04	-1.91	0.10	6.90	-12.64	0.69
TYPE 5	0.0	0.0	0.0	15.40	15.40	15.40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	6.81	-12.48	.68	24.20	-0.72	16.28	0.45	-1.82	0.04	1.04	-1.91	0.10	6.90	-12.64	0.69

174 RCYSTERCCMPP														
GRID 118			FC 3850			VC 4748								
TYPE 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TYPE 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TYPE 5	1.48	1.48	1.48	0.60	0.60	0.60	0.0	0.0	0.0	0.0	0.0	0.0	0.38	0.38
TOTAL	1.48	1.48	1.48	0.60	0.60	0.60	0.0	0.0	0.0	0.0	0.0	0.0	0.40	0.40

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175 EVANS PRODUCT														
GRID 118			FC 3873			VC 40720								
TYPE 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TYPE 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

176 NAVALAIRSTAT														
GRID 123			FC 4144			VC 40740								
TYPE 4	0.0	4.82	1.53	0.0	0.38	0.12	0.0	0.0	0.0	0.0	0.05	0.02	0.0	1.26
TOTAL	0.0	4.82	1.53	0.0	0.38	0.12	0.0	0.0	0.0	0.0	0.05	0.02	0.0	1.26

177 ELPETANTIAIR														
GRID 124			FC 4144			VC 4071								
TYPE 4	0.0	2.5	0.8	0.0	0.19	0.06	0.0	0.0	0.0	0.0	0.03	0.01	0.0	0.62
TOTAL	0.0	2.5	0.8	0.0	0.19	0.06	0.0	0.0	0.0	0.0	0.03	0.01	0.0	0.62

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	SCX			PART			CO			HC			NCX		
	S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
178															
SWIFTAGCHEVA	GRID 129			FC 3847			VC 4075								
TYPE 9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TYPE 5	1.12	1.12	1.12	1.45	1.45	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	1.12	1.12	1.12	1.45	1.45	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

179															
REPUBLICCRFA	GRID 129			FC 3849			VC 4721								
TYPE 4	0.00	1.84	0.58	0.00	0.26	0.08	0.00	0.17	0.05	0.00	0.06	0.02	0.00	0.26	0.08
TOTAL	0.00	1.84	0.58	0.00	0.26	0.08	0.00	0.17	0.05	0.00	0.06	0.02	0.00	0.26	0.08

180															
WEAVEPFERTIL	GRID 129			FC 3845			VC 4701								
TYPE 9	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TYPE 5	0.00	0.00	0.00	0.91	0.91	0.91	0.00	0.00	0.00	0.00	0.00	0.00	1.60	1.60	1.60
TOTAL	1.00	0.00	0.00	0.91	0.91	0.91	0.00	0.00	0.00	0.00	0.00	0.00	1.60	1.60	1.60

181															
SOUTHERNBLCA	GRID 129			FC 3843			VC 4717								
TYPE 4	0.00	0.87	0.28	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.06
TOTAL	0.00	0.87	0.28	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.06

182															
SOUTHERNSTAT	GRID 129			FC 3845			VC 4705								
TYPE 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TYPE 9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TYPE 5	0.00	0.00	0.00	0.18	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	0.00	0.00	0.18	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



	SCX			FALT			CC			HC			NDX		
	S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
183															
AC2FOLKITALCW	CPIC 128			FC 3838			VC 4071								
TYPE 4	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02
TOTAL	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02

184															
AYVCLAMVUNTN	CPIC 128			FC 383			VC 472								
TYPE 4	0.0	1.39	0.44	0.0	0.1	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.32	0.10	
TOTAL	0.0	1.39	0.44	0.0	0.1	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.32	0.10	

185															
ATLANPACTEA	CPIC 133			FC 3864			VC 466								
TYPE 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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186															
PLANTERSPEAN	GRIO 133			FC 3888			VC 4056								
TYPE 4	1.50	2.33	1.77	0.45	0.7	0.53	0.0	0.09	0.07	0.03	0.05	0.04	0.50	0.78	0.59
TYPE 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.21	0.21	0.21	0.0	0.0	0.0
TYPE 5	0.0	0.0	0.0	0.12	0.12	0.12	0.37	0.37	0.37	0.12	0.12	0.12	0.03	0.03	0.03
TOTAL	1.50	2.34	1.77	0.57	0.82	0.65	0.43	0.46	0.44	0.36	0.38	0.37	0.53	0.81	0.62

187															
SWIFTAGCHEMB	CPIC 133			FC 3885			VC 4637								
TYPE 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01	0.01
TYPE 9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TYPE 5	0.0	0.0	0.0	0.01	0.01	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.25	0.25	0.25
TOTAL	0.0	0.0	0.0	0.01	0.02	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.26	0.26	0.26

REPRODUCIBILITY OF THE  
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	S	SCX W	A	S	PART W	A	S	C W	A	S	HC W	A	S	NGX W	A
188															
LIPTONTEA					GRID 133			FC 3577			VC 4.668				
TYPE 4	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.07 0.05
TYPE 8	0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01 0.01
TOTAL	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.05	0.08 0.06

189															
SLEFKCONCPE					GRID 134			FC 3625			VC 4.676				
TYPE 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

190															
WESHEFIELDLV					GRID 134			FC 36.1			VC 4.654				
TYPE 4	0.06	0.07	0.07	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01
TYPE 5	0.01	0.01	0.01	0.12	0.12	0.12	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.04	0.04
TOTAL	0.07	0.08	0.08	0.12	0.12	0.12	0.01	0.01	0.01	0.01	0.01	0.01	0.06	0.06	0.06

191															
STJCEPAPERCC					GRID 135			FC 3780			VC 4.695				
TYPE 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00

192															
SOUTHERNBLCB					GRID 135			FC 3724			VC 4.635				
TYPE 4	0.00	0.29	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	0.29	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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SPV			PART			CD			HC			NGX		
S	W	A	S	W	A	S	W	A	S	W	A	S	W	A
193														
SELITMASCNA			GRID 136			FC 3844			VC 40664					
TYPE 4	0.14	0.16	0.14	0.01	0.1	0.11	0.1	0.10	0.1	0.01	0.00	0.00	0.03	0.03
TOTAL	0.14	0.16	0.14	0.01	0.01	0.11	0.1	0.10	0.1	0.01	0.00	0.00	0.03	0.03

194																
INTERCOASTAL																
GRID 136																
FC 3832																
VC 40652																
TYPE 4	0.00	0.00	0.00	0.01	0.11	0.01	0.00	0.00	0.00	0.11	0.01	0.01	0.06	0.06	0.06	RPROJ UIGIN
TYPE 5	0.0	0.0	0.0	0.89	0.89	0.89	0.0	0.0	0.0	0.1	0.0	0.0	0.01	0.01	0.01	
TOTAL	0.00	0.00	0.00	0.90	0.90	0.90	0.00	0.00	0.00	0.01	0.01	0.01	0.07	0.07	0.07	

195															
SCUTHRMATH	GRID 136			FC 3845			VC 4066								
TYPE 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

ABILITY OF  
PAGE IS P

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196

BIRSCHASPAL

GRID 141

HC 3587

VC 40646

TYPE 4	0.0	2.50	0.70	0.0	0.14	0.15	0.0	0.00	0.00	0.0	0.02	0.01	0.00	0.45	0.14
TYPE 5	0.0	0.0	0.0	5.69	5.69	5.69	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	2.50	0.70	5.69	5.83	5.84	0.0	0.00	0.00	0.0	0.02	0.01	0.00	0.45	0.14

197															
SECRTPAVINC	GRID 144		FC 3237		VC 40590										
TYPE 4	0.0	0.70	0.22	0.0	0.14	0.11	0.0	0.0	0.0	0.0	0.01	0.00	0.00	0.13	0.04
TYPE 5	0.0	0.0	0.0	11.90	11.90	11.90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.70	0.22	11.90	11.94	11.91	0.0	0.0	0.0	0.0	0.01	0.00	0.00	0.13	0.04

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN CHARLES CITY COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	0.	0.	0.	0.	0.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	22.	6.	6.	2.	7.
COMM AND INST	0.	0.	0.	0.	0.
SUB-TOTAL	22.	6.	6.	2.	7.
REFUSE DISPOSAL					
INCINERATION	1.	8.	11.	8.	1.
OPEN BURNING	0.	4.	24.	8.	2.
SUB-TOTAL	1.	13.	35.	17.	3.
PROCESS	0.	0.	0.	0.	0.
EVAP LOSSES				475.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN CHESTERFIELD COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	639.	46.	0.	6.	145.
STEAM-ELEC	74803.	104469.	665.	909.	26799.
RESIDENTIAL	331.	98.	162.	46.	102.
COMM AND INST	137.	33.	23.	7.	27.
SUB-TOTAL	75910.	104646.	850.	968.	27072.
REFUSE DISPOSAL					
INCINERATION	15.	153.	204.	153.	20.
OPEN BURNING	10.	161.	855.	302.	60.
SUB-TOTAL	25.	314.	1060.	455.	81.
PROCESS	1580.	2.	15.	0.	0.
EVAP LOSSES				4333.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN CINCINNIE COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	0.	0.	0.	0.	0.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	0.	0.	0.	0.	0.
COMM AND INST	188.	64.	11.	6.	83.
SUB-TOTAL	188.	64.	11.	6.	83.
REFUSE DISPOSAL					
INCINERATION	3.	34.	46.	34.	5.
OPEN BURNING	1.	18.	97.	34.	7.
SUB-TOTAL	5.	53.	143.	69.	11.
PROCESS	2.	326.	1668.	141.	13.
EVAP LOSSES				1540.	

Source: Virginia Air Pollution Control Board, 1971

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN GOCCHLAND COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	0.	0.	0.	0.	0.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	51.	15.	25.	7.	14.
COMM AND INST	76.	0.	4.	2.	30.
SUB-TOTAL	127.	15.	29.	9.	44.
REFUSE DISPOSAL					
INCINERATION	1.	14.	18.	14.	2.
OPEN BURNING	0.	7.	39.	14.	3.
SUB/TOTAL	2.	21.	57.	28.	5.
PROCESS	0.	0.	0.	0.	0.
EVAP LOSSES				472.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN GREENSVILLE COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	103.	7.	0.	1.	23.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	38.	11.	5.	3.	13.
COMM AND INST	0.	0.	0.	0.	0.
SUB-TOTAL	141.	18.	5.	4.	36.
REFUSE DISPOSAL					
INCINERATION	2.	20.	27.	20.	3.
OPEN BURNING	1.	11.	58.	20.	4.
SUB/TOTAL	3.	31.	85.	41.	7.
PROCESS	0.	158.	457.	0.	0.
EVAP LOSSES				928.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN HANOVER COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	0.	0.	0.	0.	0.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	163.	47.	68.	21.	46.
COMM AND INST	0.	0.	0.	0.	0.
SUB-TOTAL	163.	47.	68.	21.	46.
REFUSE DISPOSAL					
INCINERATION	0.	0.	0.	0.	0.
OPEN BURNING	0.	0.	0.	0.	0.
SUB/TOTAL	0.	0.	0.	0.	0.
PROCESS	0.	205.	237.	20.	2.
EVAP LOSSES				1647.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN HENRICO COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	44.	5.	0.	1.	20.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	574.	182.	233.	76.	242.
COMM AND INST	0.	0.	0.	0.	0.
SUB-TOTAL	618.	188.	233.	77.	263.
REFUSE DISPOSAL					
INCINERATION	21.	211.	282.	211.	28.
OPEN BURNING	7.	113.	599.	211.	42.
SUB-TOTAL	28.	324.	880.	423.	70.
PROCESS	0.	11.	59.	21.	4.
EVAP LOSSES				2407.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN NEW KENT COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	0.	0.	0.	0.	0.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	15.	4.	5.	2.	5.
COMM AND INST	0.	0.	0.	0.	0.
SUB-TOTAL	15.	4.	5.	2.	5.
REFUSE DISPOSAL					
INCINERATION	1.	7.	10.	7.	1.
OPEN BURNING	0.	4.	21.	7.	1.
SUB-TOTAL	1.	11.	30.	15.	2.
PROCESS	0.	0.	0.	0.	0.
EVAP LOSSES				1285.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN POWHATAN COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	0.	0.	0.	0.	0.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	23.	7.	11.	3.	6.
COMM AND INST	0.	0.	0.	0.	0.
SUB-TOTAL	23.	7.	11.	3.	6.
REFUSE DISPOSAL					
INCINERATION	1.	11.	14.	11.	1.
OPEN BURNING	0.	6.	30.	11.	2.
SUB-TOTAL	1.	16.	44.	21.	4.
PROCESS	0.	0.	0.	0.	0.
EVAP LOSSES				431.	



REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN PRINCE GEORGE COUNTY  
TONS/YEAR

SOURCE CATEGORY	SCX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	11089.	6506.	130.	144.	2799.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	4.	1.	2.	1.	2.
COMM AND INST	227.	86.	5.	5.	176.
SUB-TOTAL	11320.	6593.	136.	149.	2978.
REFUSE DISPOSAL					
INCINERATION	12.	122.	162.	121.	16.
OPEN BURNING	18.	288.	1529.	540.	108.
SUB/TOTAL	30.	410.	1691.	661.	124.
PROCESS	219.	346.	807.	1486.	0.
EVAP LOSSES				3448.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN SURRY COUNTY  
TONS/YEAR

SOURCE CATEGORY	SCX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	0.	0.	0.	0.	0.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	34.	10.	16.	5.	9.
COMM AND INST	0.	0.	0.	0.	0.
SUB-TOTAL	34.	10.	16.	5.	9.
REFUSE DISPOSAL					
INCINERATION	1.	8.	11.	8.	1.
OPEN BURNING	0.	4.	23.	8.	2.
SUB/TOTAL	1.	12.	34.	16.	3.
PROCESS	0.	0.	0.	0.	0.
EVAP LOSSES				386.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN SUSSEX COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
COMBUSTION OF FUELS					
INDUSTRY	381.	80.	20.	14.	168.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	28.	9.	14.	4.	7.
COMM AND INST	0.	0.	0.	0.	0.
SUB-TOTAL	409.	88.	34.	18.	175.
REFUSE DISPOSAL					
INCINERATION	2.	16.	21.	16.	2.
OPEN BURNING	1.	8.	44.	16.	3.
SUB/TOTAL	2.	24.	65.	31.	5.
PROCESS	0.	0.	0.	0.	0.
EVAP LOSSES				895.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN NANSEMOND COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<b>COMBUSTION OF FUELS</b>					
INDUSTRY	967.	214.	76.	35.	1198.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	202.	59.	106.	29.	58.
COMM AND INST	95.	7.	0.	1.	22.
SUB-TOTAL	1264.	280.	182.	65.	1278.
<b>REFUSE DISPOSAL</b>					
INCINERATION	10.	95.	127.	92.	14.
OPEN BURNING	5.	79.	422.	150.	30.
SUB/TOTAL	15.	174.	548.	241.	44.
PROCESS	5.	2178.	139.	49.	123.
EVAP LOSSES				1132.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN ISLEOFWIGHT COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<b>COMBUSTION OF FUELS</b>					
INDUSTRY	0.	0.	0.	0.	0.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	72.	21.	27.	9.	22.
COMM AND INST	0.	0.	0.	0.	0.
SUB-TOTAL	73.	21.	27.	9.	22.
<b>REFUSE DISPOSAL</b>					
INCINERATION	5.	48.	65.	48.	6.
OPEN BURNING	3.	54.	285.	101.	20.
SUB/TOTAL	8.	102.	350.	149.	27.
PROCESS	0.	0.	0.	0.	0.
EVAP LOSSES				429.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN SOUTHAMPTON COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<u>COMBUSTION OF FUELS</u>					
INDUSTRY	81.	5.	2.	1.	42.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	78.	22.	33.	10.	22.
COMM AND INST	74.	20.	15.	5.	9.
SUB-TOTAL	233.	47.	50.	16.	73.
<u>REFUSE DISPOSAL</u>					
INCINERATION	6.	59.	78.	59.	8.
OPEN BURNING	3.	54.	285.	101.	20.
SUB/TOTAL	9.	112.	363.	159.	28.
PROCESS	0.	4444.	0.	0.	0.
EVAP LOSSES				597.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN JAMES CITY COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<u>COMBUSTION OF FUELS</u>					
INDUSTRY	1918.	111.	1.	14.	348.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	53.	16.	19.	6.	19.
COMM AND INST	585.	80.	45.	16.	94.
SUB-TOTAL	2556.	207.	65.	37.	461.
<u>REFUSE DISPOSAL</u>					
INCINERATION	7.	71.	95.	71.	9.
OPEN BURNING	6.	66.	366.	166.	28.
SUB/TOTAL	13.	137.	461.	237.	38.
PROCESS	78.	1330.	55.	53.	261.
EVAP LOSSES				1200.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN YORK COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<u>COMBUSTION OF FUELS</u>					
INDUSTRY	59.	3.	0.	0.	11.
STEAM-ELEC.	11864.	5389.	338.	116.	6239.
RESIDENTIAL	309.	95.	319.	68.	56.
COMM AND INST	494.	68.	25.	13.	150.
SUB-TOTAL	12726.	5555.	682.	198.	6455.
<u>REFUSE DISPOSAL</u>					
INCINERATION	9.	90.	120.	90.	12.
OPEN BURNING	5.	84.	447.	158.	32.
SUB/TOTAL	14.	174.	567.	248.	44.
PROCESS	0.	3457.	0.	0.	0.
EVAP. LOSSES				677.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN VIRGINIA BEACH COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<u>COMBUSTION OF FUELS</u>					
INDUSTRY	164.	13.	0.	2.	48.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	524.	151.	128.	53.	182.
COMM AND INST	907.	77.	1.	11.	264.
SUB-TOTAL	1595.	241.	129.	66.	494.
<u>REFUSE DISPOSAL</u>					
INCINERATION	6.	60.	80.	60.	8.
OPEN BURNING	1.	21.	114.	40.	8.
SUB/TOTAL	7.	82.	194.	100.	16.
PROCESS	0.	6220.	0.	0.	0.
EVAP. LOSSES				4256.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN CHESAPEAKE COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<u>COMBUSTION OF FUELS</u>					
INDUSTRY	653.	371.	5592.	1722.	100362.
STEAM-ELEC.	49489.	996.	5.	623.	13072.
RESIDENTIAL	341.	106.	214.	55.	111.
COMM AND INST	0.	0.	0.	0.	0.
SUB-TOTAL	50483.	1473.	5810.	2400.	113546.
<u>REFUSE DISPOSAL</u>					
INCINERATION	9.	90.	120.	90.	12.
OPEN BURNING	2.	32.	171.	64.	12.
SUB/TOTAL	11.	122.	291.	154.	24.
PROCESS	942.	7341.	0.	0.	729.
EVAP. LOSSES				6560.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN NORFOLK COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<u>COMBUSTION OF FUELS</u>					
INDUSTRY	498.	55.	15.	11.	148.
STEAM-ELEC	1670.	491.	63.	19.	1139.
RESIDENTIAL	637.	196.	575.	128.	145.
COMM AND INST	6243.	466.	9.	62.	1461.
SUB-TOTAL	9048.	1208.	662.	222.	2894.
<u>REFUSE DISPOSAL</u>					
INCINERATION	95.	915.	329.	224.	255.
OPEN BURNING	2.	26.	141.	50.	10.
SUB/TOTAL	97.	941.	470.	274.	265.
PROCESS	0.	4634.	5.	1037.	406.
EVAP. LOSSES				6453.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN NEWPORTNEWS COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<u>COMBUSTION OF FUELS</u>					
INDUSTRY	112.	11.	0.	2.	39.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	339.	119.	213.	59.	166.
COMM AND INST	689.	146.	90.	33.	200.
SUB-TOTAL	1141.	275.	304.	94.	405.
<u>REFUSE DISPOSAL</u>					
INCINERATION	53.	490.	35.	53.	70.
OPEN BURNING	0.	0.	0.	0.	0.
SUB/TOTAL	53.	490.	35.	53.	70.
PROCESS	0.	268.	0.	0.	0.
EVAP LOSSES				3291.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN HAMPTON COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<u>COMBUSTION OF FUELS</u>					
INDUSTRY	9.	3.	0.	1.	13.
STEAM-ELEC	0.	0.	0.	0.	0.
RESIDENTIAL	270.	100.	190.	51.	149.
COMM AND INST	2321.	203.	2.	29.	706.
SUB-TOTAL	2600.	305.	192.	81.	868.
<u>REFUSE DISPOSAL</u>					
INCINERATION	24.	242.	323.	242.	32.
OPEN BURNING	5.	86.	458.	162.	32.
SUB/TOTAL	30.	328.	781.	404.	65.
PROCESS	0.	113.	0.	0.	0.
EVAP LOSSES				1603.	

SUMMARY OF AIR POLLUTANT EMISSIONS  
IN PORTSMOUTH COUNTY  
TONS/YEAR

SOURCE CATEGORY	SOX	PART	CO	HC	NOX
<u>COMBUSTION OF FUELS</u>					
INDUSTRY	190.	53.	3.	3.	48.
STEAM-ELEC	0.	0.	0.	0.	0.
PESIDENTIAL	187.	75.	106.	33.	136.
COMM. AND INST.	3724.	277.	10.	38.	874.
SUB-TOTAL	4101.	405.	119.	74.	1057.
<u>REFUSE DISPOSAL</u>					
INCINERATION	43.	405.	99.	93.	57.
OPEN BURNING	1.	20.	104.	37.	7.
SUB/TOTAL	44.	425.	202.	129.	65.
PROCESS	350.	3109.	241.	251.	1147.
EVAP. LOSSES				1827.	

ANNUAL REPORT  
COOPERATIVE FOREST FIRE CONTROL  
CLARKE-McNARY LAW

Calendar Year 1970

STATE OF VIRGINIA

I. Character and Extent of the Fire Season

Favorable weather was responsible for the low fire occurrence during January. As the year progressed, the hazard conditions increased with a resulting increase in wildfires. Although the build-up index never reached extreme levels, the combination of low relative humidity and high winds during March and April resulted in over 300 fires each month. Peak hazard was reached on April 10th when relative humidities ranged from 20% to 25% and winds averaged 20-25 miles per hour State-wide. The result was 69 fires with 10 of these ranging in area burned from 125 to 592 acres. Acres burned on this one day totaled approximately one-fifth of the entire burn for 1970.

During late summer and early fall, drought conditions spread over the State and by early October, build-up indices of over 80 were recorded. General rains occurred beginning about mid-October, which restored streamflow and lowered the hazard in all but the Dismal Swamp section in the extreme southeast. On December 4th, relative humidities as low as 12 were recorded and winds of up to 60 miles per hour were measured. As might be expected, about 99 fires occurred and these burned approximately 2,241 acres. A check reveals that 39.8% of the total forest acreage burned in 1970 was lost on the two days mentioned.

Four fires burned over 300 acres and 17 fires burned over 100 acres of forest land.

Comparison of Fire Occurrence and Acreage Burned 1969 and 1970

<u>Year</u>	<u>Period of Year</u>	<u>No. Fires</u>	<u>Percent of Year's Total</u>	<u>Acreage Burned*</u>	<u>Percent of Year's Total</u>	<u>Average Acres per Fire*</u>
1969	Jan.-June	1,523	79	8,196.7	76	5.4
1970	Jan.-June	1,309	72	6,851.0	64	5.2
1969	July-Dec.	411	21	2,600.3	24	6.3
1970	July-Dec.	501	28	3,850.0	36	7.7
1969	Total	1,934		10,797.0		5.6
1970	Total	1,810		10,701.0		5.9

\*Includes only forest acres burned.

Source: Ralph Bartholameu, Chief of Fire Control, Charlottesville, Va. (296-6174)



**Number and Percent of Fires and Acreage Burned by Months**

<u>Month</u>	<u>No. Fires</u>	<u>Percent of Total</u>	<u>Acreage Burned</u>	<u>Percent of Total</u>
January	48	3	224	2
February	324	18	775	7
March	333	18	796	7
April	437	24	4,443	42
May	79	4	379	4
June	88	5	234	2
July	19	1	40	.2
August	19	1	103	.8
September	76	4	128	1
October	68	4	157	2
November	85	5	488	5
December	234	13	2,934	27
<b>TOTAL</b>	<b>1,810</b>	<b>100</b>	<b>10,701</b>	<b>100</b>

The following tables compare the record for 1970 with the year 1969 and with averages for the preceding five years. Fire cause information is also tabulated for ready reference.

<u>Class of Fires</u>	<u>Number of Fires</u>			<u>Percent of Total</u>		
	<u>1970</u>	<u>1969</u>	<u>Average 1965-1969</u>	<u>1970</u>	<u>1969</u>	<u>Average 1965-1969</u>
A - $\frac{1}{4}$ Acre or less	612	494	620	33.8	25.5	27.9
B - Over $\frac{1}{4}$ and less than 10 acres	1010	1229	1397	55.8	63.6	63.0
C - 10 to 99 acres	167	200	188	9.3	10.3	8.5
D - 100 to 299 acres	17	9	11	.9	.5	.5
E - 300 to 999 acres	4	2	2	.2	.1	.1
F - 1000 to 5,000 acres	0	0	1	0	0	0
<b>TOTAL</b>	<b>1810</b>	<b>1934</b>	<b>2219</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

<u>Causes of Fires</u>	<u>Number of Fires</u>			<u>Percent of Total</u>		
	<u>1970</u>	<u>1969</u>	<u>Average 1965-1969</u>	<u>1970</u>	<u>1969</u>	<u>Average 1965-1969</u>
Lightning	25	19	24	1.4	1.0	1.1
Campfire	15	37	44	.8	1.9	2.0
Smoking	351	394	515	19.4	20.4	23.2
Debris Burning	602	626	636	33.3	32.4	28.6
Incendiary	180	224	209	9.9	11.6	9.4
Equipment Use	89	57	57	4.9	2.9	2.6
Railroads	212	210	266	11.7	10.9	12.0
Children	153	--	--	8.5	--	--
Miscellaneous	183	367	469	10.1	18.9	21.1
<b>TOTAL</b>	<b>1810</b>	<b>1934</b>	<b>2220</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

1970 POLLUTANT AND EFFECTS NETWORK  
NATIONAL AIR SURVEILLANCE NETWORKS BRANCH  
DIVISION OF AIR QUALITY AND EMISSION DATA

PHS REGION I

CONNECTICUT

g Bridgeport  
g Hartford  
g New Haven  
g Waterbury

MAINE

Portland  
g Acadia Nat'l Pk. NU

MASSACHUSETTS

g,m Boston  
g Cambridge  
g Fall River  
g New Bedford  
g Springfield  
g Worcester

NEW HAMPSHIRE

Concord  
g,p Coos Co. NU

RHODE ISLAND

E. Providence  
g Providence  
g Washington Co. NU

VERMONT

Burlington  
Orange Co. NU

PHS REGION II

DELAWARE

g Newark  
g Wilmington  
g Kent Co. NU

NEW JERSEY

Bayonne  
g Camden  
g Elizabeth  
g Glassboro  
Hamilton  
g,m Jersey City  
g Marlton (Burlington Co.)  
g,m Newark

NEW JERSEY Continued

g Paterson  
Perth Amboy  
g Trenton

NEW YORK

g Albany  
g,m Buffalo  
g,m New York  
g Niagara Falls  
g,m Rochester  
g Syracuse  
g Utica  
g Yonkers  
g Cape Vincent NU (Jefferson Co.)

PENNSYLVANIA

g Allentown  
Altoona  
Bethlehem  
g Erie  
Harrisburg  
Hazleton  
g Johnstown  
g Lancaster  
g,m Philadelphia  
g,c Philadelphia CAMP  
g,m Pittsburgh  
g Reading  
g Scranton  
g Warminster  
g West Chester  
Wilkes-Barre  
g York  
Clarion Co. NU

PHS REGION III

DIST. OF COLUMBIA

g,m Washington  
g,c Washington CAMP

c	- Cascade Impactor
g	- 24-Hour Gas Sampler
m	- Membrane Filter Sampler
p	- Precipitation Collector
*	- Not sampling for Suspended Particulate
CAMP	- Continuous Air Monitoring Station
NU	- Nonurban

Source: Air Pollution Central Office,  
Cincinnati, Ohio 45227

Number of Fires by Causes by Districts

District:	I	II	III	IV	V	VI	VII	VIII	IX	TOTAL
<u>Causes</u>										
Lightning	3	2	2	3	4	4	4	1	2	25
Campfire	0	2	3	2	2	3	2	1	0	15
Smoking	40	42	35	62	40	40	8	26	58	351
Debris Burning	44	66	92	87	76	99	17	58	63	602
Incendiary	11	12	14	28	32	52	7	3	21	180
Equipment Use	7	7	13	16	11	7	3	6	19	89
Railroads	24	76	17	27	45	10	4	9	0	212
Children	6	32	34	18	19	11	4	10	19	153
Miscellaneous	12	22	17	23	20	53	13	8	15	183
<b>TOTAL</b>	<b>147</b>	<b>261</b>	<b>227</b>	<b>266</b>	<b>249</b>	<b>279</b>	<b>62</b>	<b>122</b>	<b>197</b>	<b>1,810</b>

Percent of Fires by Causes by Districts

District:	I	II	III	IV	V	VI	VII	VIII	IX	TOTAL
<u>Causes by Percent</u>										
Lightning	2.0	.8	.9	1.1	1.6	1.4	6.5	.8	1.0	1.4
Campfire	0	.8	1.3	.8	.8	1.1	3.2	.8	0	.8
Smoking	27.2	16.1	15.4	23.3	16.1	14.3	12.9	21.3	29.5	19.4
Debris Burning	29.9	25.3	40.5	32.7	30.5	35.5	27.4	47.5	32.0	33.3
Incendiary	7.5	4.6	6.2	10.5	12.9	18.6	11.3	2.5	10.7	9.9
Equipment Use	4.8	2.7	5.7	6.0	4.4	2.5	4.8	4.9	9.6	4.9
Railroads	16.3	29.1	7.5	10.2	18.1	3.6	6.5	7.4	0	11.7
Children	4.1	12.2	15.0	6.8	7.6	4.0	6.5	8.2	9.6	8.5
Miscellaneous	8.2	8.4	7.5	8.6	8.0	19.0	20.9	6.6	7.6	10.1
<b>TOTAL</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

<u>Total Area Burned</u>	<u>1970</u>	<u>1969</u>	<u>1965-1969 5-Year Average</u>
Organized Territory (Exclusive of National Forests)	10,701	10,797	11,299
 Percent of Total Protected Area Burned	 .074	 .075	 .079

Fires Burned by Regional Reporting Districts 1970

<u>District</u>	<u>Fires</u>		<u>Area</u>	
	<u>Number Fires</u>	<u>Percent of Total</u>	<u>Acreage Burned</u>	<u>Percent of Total</u>
Tidewater	602	33.3	3,464	32.4
North Piedmont	245	13.5	1,069	10.0
South Piedmont	529	29.2	2,018	18.8
Northwest	74	4.1	1,146	10.7
Southwest	360	19.9	3,004	28.1
<b>TOTAL</b>	<b>1,810</b>	<b>100.0</b>	<b>10,701</b>	<b>100.0</b>

**KENTUCKY**

Ashland  
 g Bowling Green  
 g Covington  
 g Lexington  
 g,m Louisville

**MARYLAND**

g,m Baltimore  
 g Calvert Co. NU

**NORTH CAROLINA**

g Charlotte  
 g Durham  
 g Greensboro  
 g Winston-Salem  
 g,p,c Cape Hatteras Nat'l S.S. NU  
 p Raleigh-Durham Airport

**VIRGINIA**

Danville  
 Hampton  
 Lynchburg  
 g Newport News  
 g,m Norfolk  
 g Portsmouth  
 g Richmond  
 Roanoke  
 g Shenandoah Pk. NU  
 g Wythe Co. (SW) NU  
 McLean

**WEST VIRGINIA**

g Charleston  
 South Charleston

**PUERTO RICO**

g Bayamon  
 Catano  
 g Guayanilla  
 g Ponce  
 g,m San Juan

**PHS REGION IV****ALABAMA**

g,m Birmingham  
 Gadsden  
 Huntsville  
 g Mobile  
 g Montgomery

**FLORIDA**

g Jacksonville  
 g,m Miami  
 g St. Petersburg  
 g,m Tampa  
 g,p Hardee Co. NU

**GEORGIA**

g,m Atlanta  
 g Columbus  
 g Savannah

**MISSISSIPPI**

g Jackson  
 g Jackson Co. NU

**SOUTH CAROLINA**

Columbia  
 Greenville  
 g,p Richland Co. NU

**TENNESSEE**

g Chattanooga  
 g Knoxville  
 g,m Memphis  
 g Nashville  
 g,p Cumberland Co. NU

**PHS REGION V****ILLINOIS**

g,m Chicago  
 g,c Chicago CAMP  
 East St. Louis  
 Joliet  
 Moline  
 N. Chicago  
 g Peoria  
 g Rockford  
 Rock Island  
 Springfield

**INDIANA**

g E. Chicago  
 g Evansville  
 g Ft. Wayne  
 g Gary  
 g Hammond  
 g,m Indianapolis  
 Muncie  
 g New Albany  
 g South Bend  
 Terre Haute  
 g,p Morgan-Monroe Counties NU  
 Parke Co. NU

c	- Cascade Impactor
g	- 24-Hour Gas Sampler
m	- Membrane Filter Sampler
p	- Precipitation Collector
*	- Not sampling for Suspended Particulate
CAMP	- Continuous Air Monitoring Station
NU	- Nonurban

# MICHIGAN

g Dearborn  
g,m Detroit  
g Flint  
g Grand Rapids  
g Lansing  
g Saginaw  
g Trenton

# OHIO

g,m Akron  
g Canton  
g,m Cincinnati  
g,c Cincinnati CAMP  
g,m Cleveland  
g,m Columbus  
g,m Dayton  
g,m Toledo  
g Youngstown

# WISCONSIN

Eau Claire  
Kenosha  
g Madison  
g,m Milwaukee  
Racine  
Superior  
g,p Door Co. NU

# PHS REGION VI

# IOWA

Cedar Rapids  
Davenport  
g Des Moines  
g Dubuque

# KANSAS

g,m Kansas City  
g Topeka  
g,m Wichita

# MINNESOTA

g Duluth  
g,m Minneapolis  
Moorhead  
g,m St. Paul

# MISSOURI

g Kansas City  
g,m St. Louis  
g,c St. Louis CAMP  
g Shannon Co. NU

# NEBRASKA

g Lincoln  
g Omaha  
g Thomas Co. NU

# NORTH DAKOTA

Bismarck

# SOUTH DAKOTA

Sioux Falls  
g Black Hills Forest NU

# PHS REGION VII

# ARKANSAS

g\* El Dorado  
g Little Rock  
Texarkana  
West Memphis  
Montgomery Co. NU

# LOUISIANA

g Baton Rouge  
g\* Carville  
g,m New Orleans  
g Shreveport

# NEW MEXICO

g Albuquerque  
Rio Arriba Co. NU

# OKLAHOMA

g,m Oklahoma City  
g,m Tulsa  
g,p Cherokee Co. NU

# TEXAS

g Amarillo  
g Austin  
g Beaumont  
g Corpus Christi  
g,m Dallas  
g,m El Paso  
g,m Ft. Worth  
g,m Houston  
g Lubbock  
g Pasadena  
g,m San Antonio

c - Cascade Impactor  
g - 24-Hour Gas Sampler  
m - Membrane Filter Sampler  
p - Precipitation Collector  
\* - Not sampling for Suspended  
Particulate  
CAMP - Continuous Air Monitoring  
Station  
NU - Nonurban

TEXAS Continued

g Wichita Falls  
g,p Matagorda Co. NU  
g,p Tom Green Co. NU

PHS REGION VIII

COLORADO

g,m Denver  
g,c Denver CAMP  
Montezuma Co. NU

IDAHO

Boise  
Butte Co. NU

MONTANA

Helena  
g,p Glacier Nat'l Pk. NU

UTAH

Ogden  
g Salt Lake City

WYOMING

g Casper  
Cheyenne  
g Yellowstone Nat'l Pk. NU

PHS REGION IX

ALASKA

Anchorage  
g Fairbanks

ARIZONA

Paradise Valley (Maricopa Co.)  
g,m Phoenix  
g Tucson  
g,p Grand Canyon Nat'l Pk. NU

CALIFORNIA

g Anaheim  
g Berkeley  
Burbank  
g Fresno  
g Glendale  
g,m Long Beach  
g,m Los Angeles  
g,m Oakland  
Ontario  
g Pasadena  
Riverside  
g Sacramento  
g San Bernardino

CALIFORNIA Continued

g,m San Diego  
g,m San Francisco  
g San Jose  
g Santa Ana  
g Torrance  
g,p Humboldt Co. NU

NEVADA

Las Vegas  
Reno  
White Pine Co. NU

OREGON

Eugene  
Medford  
g,m Portland  
Curry Co. NU

WASHINGTON

g,m Seattle  
g Spokane  
g Tacoma  
g,p King Co. NU

HAWAII

g,m Honolulu

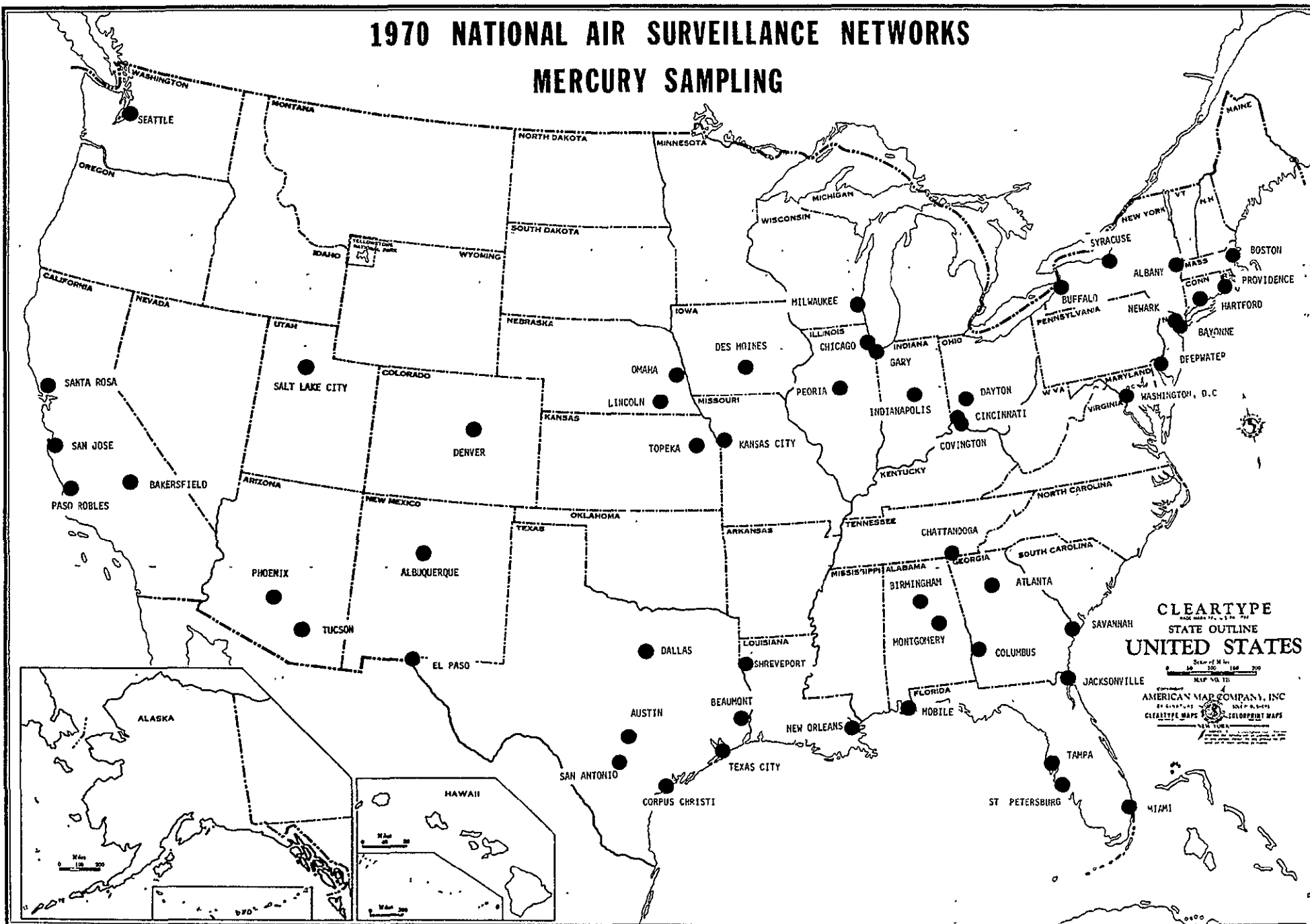
c	- Cascade Impactor
g	- 24-Hour Gas Sampler
m	- Membrane Filter Sampler
p	- Precipitation Collector
*	- Not sampling for Suspended Particulate
CAMP	- Continuous Air Monitoring Station
NU	- Nonurban

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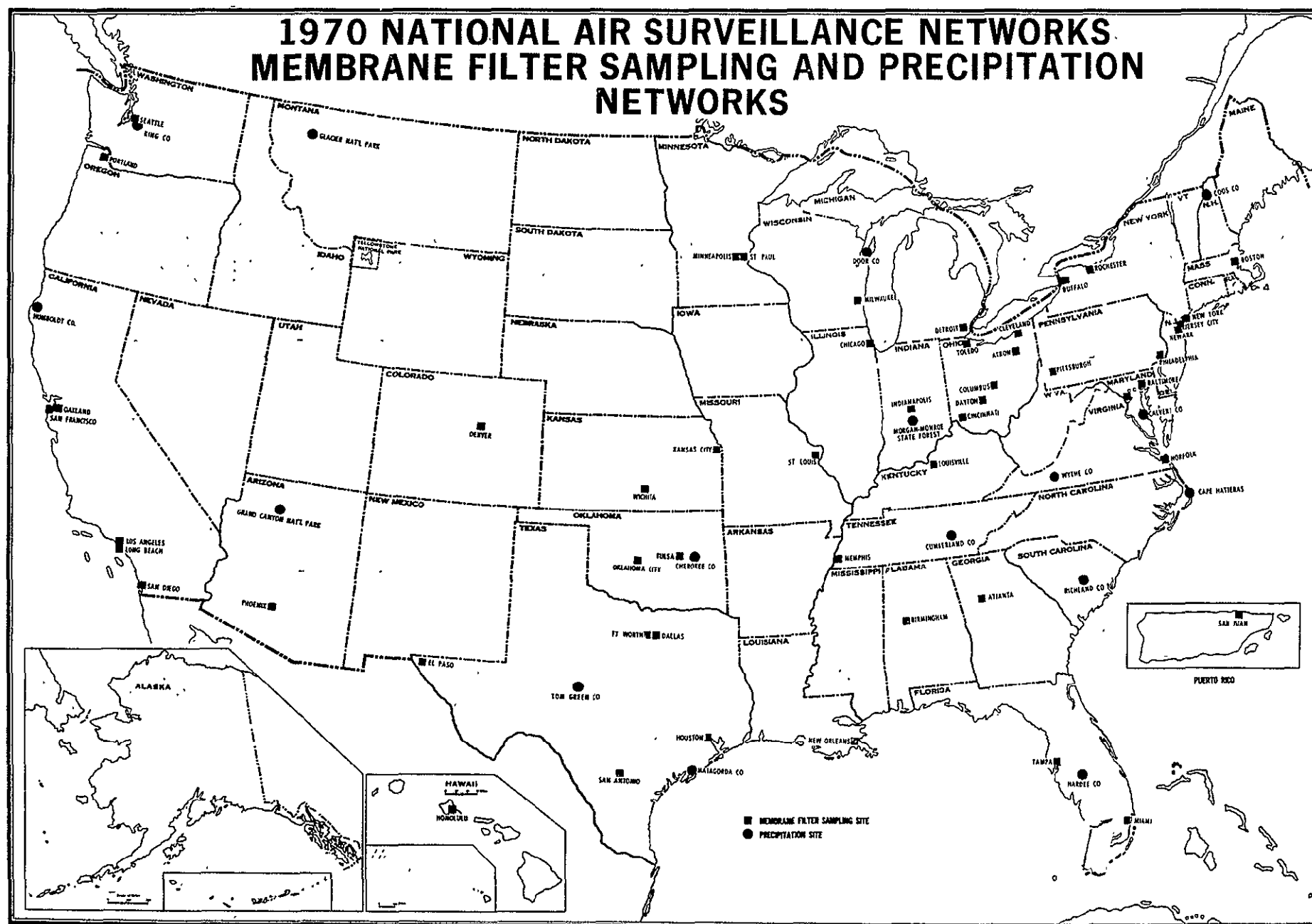
I-85

# 1970 NATIONAL AIR SURVEILLANCE NETWORKS

## MERCURY SAMPLING

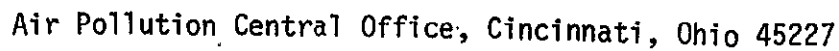


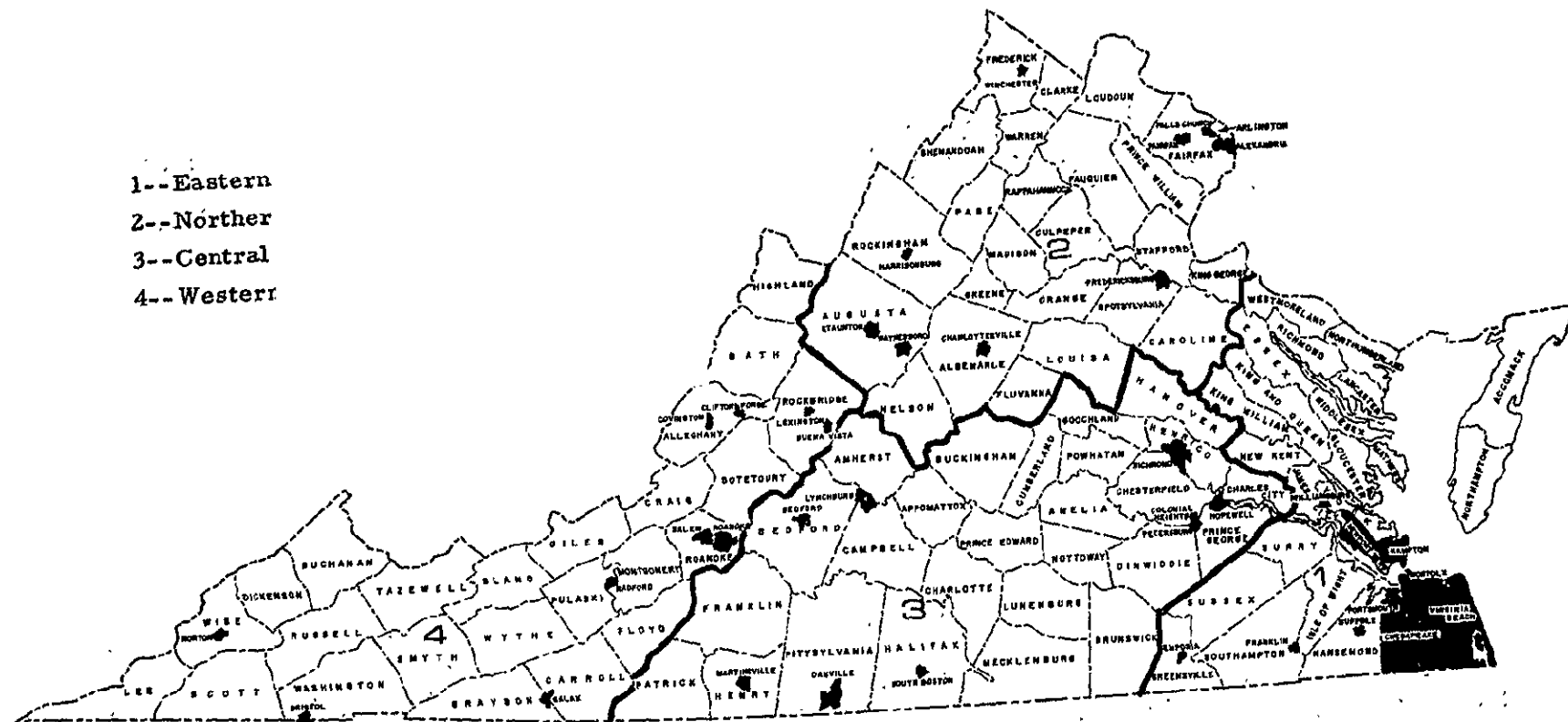




Air Pollution Central Office, Cincinnati, Ohio 45227

1-88



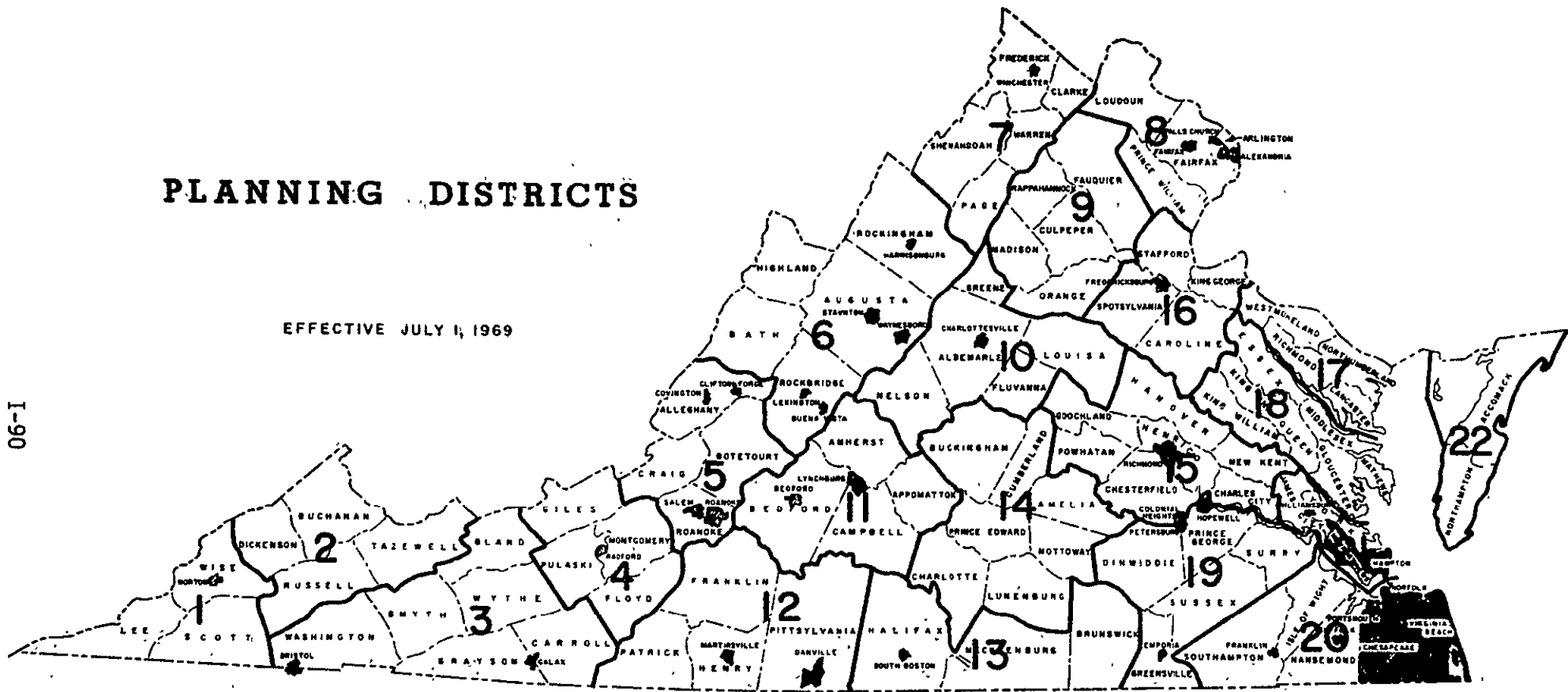


REVENUE OFFICE  
DIVISION OF STATE PLANNING AND COMMUNITY AFFAIRS

State Air Pollution Control Board  
Administrative Regions

# PLANNING DISTRICTS

EFFECTIVE JULY 1, 1969

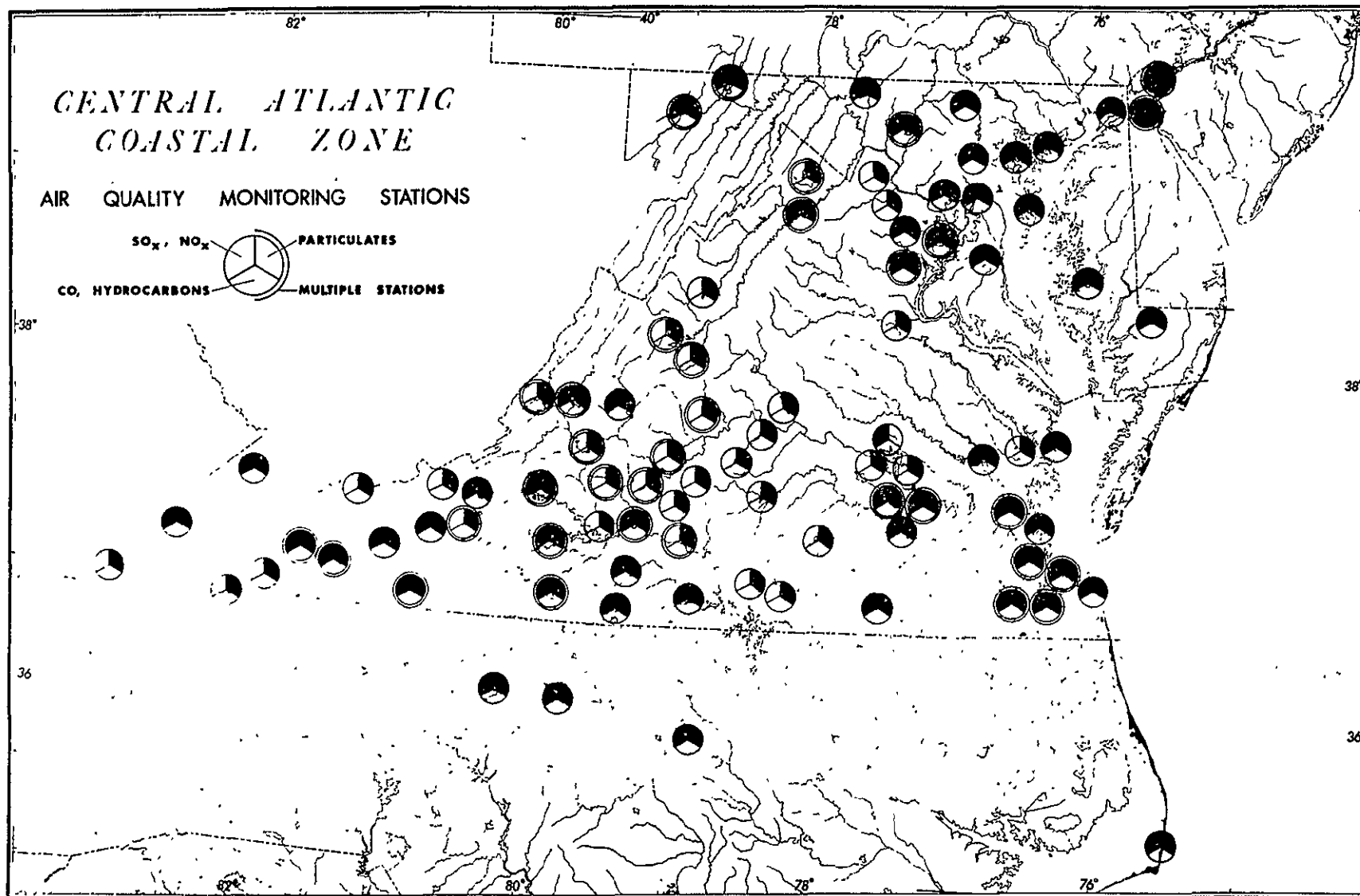


7-69

AIR QUALITY CONTROL REGION 6 COMPRISES PLANNING DISTRICTS 20  
AND 21; REGION 5 PLANNING DISTRICTS 15 AND 19.

GOVERNOR'S OFFICE  
DIVISION OF STATE PLANNING AND COMMUNITY AFFAIRS

1-90a



Virginia and Maryland air quality monitoring stations; North Carolina stations are part of the Federal network.

VIRGINIA AIR POLLUTION CONTROL BOARD

A. Tabulation of Stations and Types of Analysis

<u>Location</u>	<u>Station Number</u>	<u>Dustfall</u>	<u>Sulfation Rate</u>	<u>Suspended Particulates</u>
Alexandria (Fire Station #1)	126-A	X	X	
Alexandria (Sewage Plant)	126-B	X	X	
Alleghany Co. (Memorial Hospital)	11-A	X		
Amherst Co. (Madison Heights)	53-A	X		X
Amherst Co. (Madison Heights)	53-B	X		
Amherst Co. (Snowden)	53-C	X		
Appomattox Co. (State Lime Plant)	57-A	X		
Arlington Co. (Hudson St. Fire Sta.)	47-A	X	X	
Augusta Co. State Lime Plant	25-A	X		
Augusta Co. (State Lime Plant)	25-B	X		
Augusta Co. (State Lime Plant)	25-C	X		
Augusta Co. (State Lime Plant)	25-D	X		
Bedford (Municipal Bldg.)	151-A	X	X	X
Bedford (County Jail)	151-B	X		X
Bedford (Health Clinic)	151-C	X		

<u>Location</u>	<u>Station Number</u>	<u>Dustfall</u>	<u>Sulfation Rate</u>	<u>Suspended Particulates</u>
Bedford Co. (Big Island)	52-B	X	X	
Bedford Co. (Boonsboro)	52-A	X		
Botetourt Co. (Buchanan)	20-A	X		
Botetourt Co. (Buchanan)	20-B	X		
Buchanan Co.	4-B	X	X	
Buckingham Co. (Arvonía)	58-A	X		
Buckingham Co. (New Canton)	58-B	X		
Campbell Co. (Altavista)	56-A	X		
Campbell Co. (Altavista)	56-E	X	X	
Campbell Co. (Brookneal)	56-D	X		
Campbell Co. (Brookneal)	56-C	X		
Campbell Co. (State Ag. Lab.)	56-B	X		X
Chesapeake (Armory)	176-A	X	X	X
Chesapeake (#2 Fire Sta.)	176-B	X	X	
Chesapeake (#1 Fire Sta.)	176-C	X		
Chesterfield Co. (Bon Air)	71-A	X		
Clifton Forge	103-A	X	X	
Colonial Heights (Municipal Bldg.)	152-A	X	X	

<u>Location</u>	<u>Station Number</u>	<u>Dustfall</u>	<u>Sulfation Rate</u>	<u>Suspended Particulates</u>
Colonial Heights (Near Ettrick)	152-C	X		
Covington (Nettleton Co.)	104-B	X	X	
Covington (Army Reserve Center)	104-C	X		
Covington (Northside Drive-In)	104-D	X		
Danville (Church Street)	153-C	X		
Emporia	177-A	X	X	
Fairfax (University Ave.)	128-A	X	X	
Falls Church (City Property Yard)	129-A	X	X	
Fluvanna Co. (Bremo Bluff)	39-A	X		
Franklin (Municipal Bldg.)	178-A	X	X	
Franklin Co. (Rocky Mount)	51-A	X	X	
Franklin Co. (Rocky Mount)	51-B	X		
Frederick Co. (Stephens City)	28-A	X		
Fredericksburg (Water Plant)	130-A	X		
Galax (Texaco Bulk Plant)	105-B	X		
Galax (Esso Bulk Plant)	105-C	X	X	
Giles Co. (Kimballton)	9-A	X		X



<u>Location</u>	<u>Station Number</u>	<u>Dustfall</u>	<u>Sulfation Rate</u>	<u>Suspended Particulates</u>
Hampton (H.Q. Fire Sta.)	179-A	X	X	
Harrisonburg	131-A	X		
Henrico Co. (Battlefield Park)	72-C	X		X
Hopewell (City Point)	154-A	X	X	
Hopewell (Garrett's Marine)	154-B	X	X	X
Hopewell (Armory)	154-C	X	X	
King William Co. (West Point)	82-A	X	X	
Lancaster Co. (Windmill Point)	93-A	X	X	
Lee Co. (Woodway)	1-A	X		
Lexington	106-A	X	X	
Loudoun Co. (Dulles Airport)	38-A	X		
Lynchburg (City Courthouse)	155-A	X		
Lynchburg (9th & Commerce)	155-B	X	X	
Lynchburg (Fairview Hts.)	155-C	X		
Lynchburg (Water Filtration Plant)	155-D	X		
Lynchburg (Rivermont)	155-E	X		
Lynchburg (Fort Hill)	155-F	X		
Lynchburg (16th & Kemper)	155-G	X		
Martinsville	156-A	X	X	

<u>Location</u>	<u>Station Number</u>	<u>Dustfall</u>	<u>Sulfation Rate</u>	<u>Suspended Particulates</u>
Mecklenburg Co. (Chase City)	63-A	X		
Mecklenburg Co. (South Hill)	63-B	X		
Middlesex (Syringa)	92-A	X		
Montgomery Co. (VPI Orchard)	18-A	X	X	
Nelson Co. (Piney River)	32-B	X		
Nelson Co. (Piney River)	32-C	X		
Nelson Co. (Piney River)	32-D	X	X	
Newport News (Main St.)	180-A	X	X	
Norfolk (Thole Street)	181-A	X	X	
Norfolk (Lambert's Point)	181-B	X	X	
Norfolk (St. Helena C. G. Sta.)	181-C	X	X	
Norfolk (Goode Elem. Sch.)	181-D	X	X	
Norfolk (Lansdale Elem. Sch.)	181-E	X	X	
Nottoway (Blackstone)	65-A	X		
Petersburg (Main Fire Sta.)	157-A	X	X	
Pittsylvania (Chatham)	55-A	X	X	
Portsmouth (Police H. Q. Bldg.)	182-A	X	X	
Prince Edward Co. (Farmville)	61-A	X		

<u>Location</u>	<u>Station Number</u>	<u>Dustfall</u>	<u>Sulfation Rate</u>	<u>Suspended Particulates</u>
Prince William Co. (Garfield)	45-B	X	X	X
Prince William Co. (Manassas)	45-A	X	X	X
Pulaski Co. (Pulaski)	17-B	X	X	
Radford (Barnett School)	108-A	X	X	
Radford (Telephone Co.)	108-B	X		
Radford (Municipal Bldg.)	108-C	X		
Radford (Stevens Supply)	108-D	X		
Roanoke (Health Department)	109-A	X	X	
Roanoke (S. E. Section)	109-B	X		
Smyth Co. (Marion)	15-A	X	X	
Smyth Co. (Marion)	15-F	X		
Smyth Co. (Saltville)	15-B	X	X	
Smyth Co. (Saltville)	15-C	X	X	X
Smyth Co. (Saltville)	15-D	X		
Smyth Co. (Saltville)	15-E	X		
South Boston (Water Plant)	159-A	X	X	X
Staunton (Main Fire Sta.)	132-A	X		
Suffolk (#1 Fire Sta.)	183-A	X	X	

<u>Location</u>	<u>Station Number</u>	<u>Dustfall</u>	<u>Sulfation Rate</u>	<u>Suspended Particulates</u>
Suffolk (#2 Fire Sta.)	183-B	X		
Tazewell Co. (Bluefield)	7-A	X		
Virginia Beach (Kempsville)	184-B	X	X	
Warren Co. (Front Royal)	30-A	X	X	
Washington Co.	14-B	X		
Waynesboro (Municipal Bldg.)	133-A	X		
Waynesboro (S. Delphine Ave.)	133-B	X		
Waynesboro (Freed Co.)	133-C	X	X	
Waynesboro (Sewage Plant)	133-D	X		X
Waynesboro (Westwood School)	133-E	X		
Williamsburg (Municipal Bldg.)	185-A	X	X	
Winchester	134-A	X		
Wise Co. (Crane's Nest)	2-A	X	X	
Wythe Co. (Wytheville)	16-A	X	X	
York Co. (Poquoson)	89-B	X	X	
York Co. (Yorktown)	89-A	X	X	

THOSE ADDITIONAL STATIONS NOT INCLUDED ABOVE

Arlington Co. (2049 N. 15th St.)	47-B			X
Arlington Co. (Sewage Plant)	47-C			X

<u>Location</u>	<u>Station Number</u>	<u>Dustfall</u>	<u>Sulfation Rate</u>	<u>Suspended Particulates</u>
Bristol (Bristol Health Dept.)	101-A			X
Chesapeake (Admiral Rd. Apts.)	176-D			X
Henrico Co. (Fulton Yard)	72-D		X	
Loudoun Co. (Leesburg)	38-B			X
Martinsville (J. C. Penny's)	156-B			X
Radford (Utility Bldg.)	108-F			X
Warren Co. (Front Royal)	30-B		X	
Warren Co. (Front Royal)	30-C			X

# EMISSION INVENTORY QUESTIONNAIRE

**SECTION I - FUEL USE FOR GENERATION OF HEAT, STEAM, AND POWER**

[illegible]

"Number boilers in sequence.

Source: Virginia Air Pollution Control Board, 1971

Refuse disposed of \_\_\_\_\_ on site; \_\_\_\_\_ off site- Location of disposal site and/or name of hauler \_\_\_\_\_  
Normal on-site combustion operating schedule: \_\_\_\_\_ hours/day; \_\_\_\_\_ days/week; \_\_\_\_\_ weeks/year  
Seasonal and/or peak operation period: (specify) \_\_\_\_\_

Normal on-site combustion operating schedule: \_\_\_\_\_ hours/day; \_\_\_\_\_ days/week; \_\_\_\_\_ weeks/year

Season 1 and/or peak operation period: (specify)

[illegible]

<sup>b</sup> Tons, pounds or gallons per year.

<sup>d</sup>Use identification code on page 2.

Use separate page to list Nameplate data.

Solids and/or gases (include chemical description.)

<sup>8</sup>Pounds or tons per year.

<sup>n</sup>Make estimates if possible, give basis for all estimates.





PROCESS TYPE AND PLANT AGE

Nature of Business (Products or Services Provided)	Quantity Produced	Process Name (Give Description and detailed flow chart of process on separate page) <sup>a</sup>	Approximate Age of Major Pieces of plant Equipment

STACK PARAMETERS

Stack Number	Stack Height	Stack Exit (inside Dia)	Total Gas Volume	Exit Gas Temperature	Exit Gas Velocity	Distance to Nearest Property Line

<sup>a</sup> Please give an indication of which parts of the process release materials into the atmosphere.

Identification Code for Method of Disposal. (see page 3)

1. Open-burning Dump.
2. Sanitary landfill (no burning).
3. Burned in Boiler or furnace.
4. Incinerator, Single chamber.
5. Incinerator, Multiple chamber.
6. Incinerator, Rotary.
7. Conical metal burner (Teepee)
8. Other (specify).

Identification Code for Pollution control equipment.

1. Baghouse.
2. Cyclone.
3. Wet Scrubber.
4. Electrostatic Precipitator.
5. Settling Chamber
6. Impingement Scrubber.
7. Wetted Baffles.
8. Afterburners.
9. Other (specify)

## APPENDIX J

### INDUSTRIAL WATER EFFLUENT SOURCES

## APPENDIX J

### INDEX

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## INDUSTRIAL WATER EFFLUENT SOURCES

The industrial water users are grouped into three major divisions of the James River. The upper reaches of the river beyond Richmond are not within RICHEL but are presented for comparative purposes. The major waterworks of municipal or private ownership are listed in an accompanying sets of tables along with their use, capacity and other factors. During the summer months when these figures were spot checked for values not in the original data, several of these waterworks were operating at capacity.

# INDUSTRIAL DISCHARGES

## MIDDLE JAMES

<u>Map Ref. Letter<sup>1</sup></u>	<u>State Dis. Site Letter</u>	<u>Name of Place</u>	<u>County/City</u>
A	M	VEPCO - 12 Street Station	Richmond
B	R	Standard Paper Company	Richmond
C	P	Federal Board & Paper Co. (2 Plants)	Richmond
D	N	Albemarle Paper Company	Richmond
E	S	Mobile Chemical Company	Richmond
F	T	Richmond Guano Company	Richmond
G	X	E.I. DuPont de Nemours & Co., Inc.	Chesterfield
H	Z	Reynolds Metals Company	Chesterfield
I	A1	VEPCO - Chesterfield Power Station	Chesterfield
J	Y	Southern Materials Inc.	Henrico
K	B1	The American Tobacco Co.	Chesterfield
L	C1	Allied Chemical Corp.-Fibers Div.	Chesterfield
M	W1	Firestone Synthetics Inc.	Hopewell
N	Q1	Allied Chemical Corp.-Industrial Ch.	Hopewell
O	R1	Allied Chemical Corp.-Nitrogen Div.	Hopewell
P	S1	Allied Chemical Corp.-Sulfuric Acid	Hopewell
Q	T1	Continental Can Company, Inc.	Hopewell
R	U1	Puremade Products, Inc.	Hopewell

## LOWER JAMES

<u>Map Ref. Letter<sup>1</sup></u>	<u>State Dis. Site Letter</u>	<u>Name of Place</u>	<u>County/City</u>
S	E1	S. Wallace Edwards & Sons	Surry
T	N	Dow Chemical Co.	James City County
U	W	VEPCO - Hampton	Hampton
V	D1	Gwaltney, Inc.	Isle of Wight
W	B1	Smithfield Ham & Products Co., Inc.	Isle of Wight
X	C1	Smithfield Packing Co.	Isle of Wight
Y	G1	Eberwine Brothers	Nansemond
Z	V	Virginia Chemicals, Inc.	Portsmouth
AA	J	VEPCO - Portsmouth	Chesapeake
BB	A	Weaver Fertilizer Co.	Chesapeake
CC	B	Smith Douglas Fertilizer Co.	Chesapeake
DD	C	Swift & Company	Chesapeake
EE	D	Eppinger & Russell Co.	Chesapeake
FF	F	Republic Creosoting Co.-Div. of Reilly Tar & Chemical Corp.	Chesapeake
GG	G	Texaco, Inc.	Chesapeake
HH	H	F. S. Royster Guano Co.	Chesapeake
II	K	Sinclair Refining Co.	Portsmouth
JJ	L	Atlantic Creosoting Co., Inc.	Portsmouth
KK	T	VEPCO - Reeves Avenue	Norfolk

### ADDITIONS

\*denotes Middle James

+denotes Lower James

LL	V1*	Hercules Powder Company	Hopewell
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<sup>1</sup>See Fig. 19

UPPER JAMES RIVER

Name	Location	Total Water Intake Daily (mgd)			Average Daily Discharge (pounds per day)					Discharge Pt.
		Municipal Or Private	Surface Water	Ground-water	B.O.D.	C.O.D.	Total Solids	Phosphorus	Nitrogen	
ITT Morton	Crozet	4.93	(1.49 other?)		77	138	2020	25.04	75.34	Lickinghole Creek
Mead Corporation	Lynchburg	1.00	8.50	-	30000	52000	150000	26	.4275	James River
Veeco/Bremo	Fluvanna	-	252.00	.002	-	-	-	-	-	James River
Georgia-Bonded Fiber	Buena Vista	.001	.77	-	15	781	117	.34	.91	James River
Babcock & Wilcox Co.	Lynchburg	.0024	-	-	.04	1.66	2.55	.05	1.64	James River
Reeves Brothers, Inc.	Buena Vista	.09	.02	-	-	-	-	-	-	Indian Gap Run
Owens Illinois Mill	Big Island	-	12.80	.01	16156	47612	81961	10.64	239.77	James River

Large companies not listed because application has not been submitted, or application contains insufficient information, or application contains business confidential information include:

Westvaco Corporation, Covington  
Bonded Fibers Division

Source: U.S. Army Corps of Engineers, Norfolk District; Discharge Permits

MIDDLE JAMES RIVER

Name	Location	Total Water Intake Daily (mgd)			Average Daily Discharge (pounds per day)					Discharge Pt.
		Municipal Or Private	Surface Water	Ground-water	B.O.D.	C.O.D.	Total Solids	Phosphorus	Nitrogen	
Allied/fertilizer	Hopewell	43.90	-	-	1603	4205	30180	339	4626	James
Allied/fibers	Hopewell	-	34.05	-	976.1	7768	46932	154.06	214.86	James
Allied/plastics	Hopewell	1.27	81.68	-	6634	26114	149675	191	7893	Gravelly Run
Continental Can	Hopewell	2.000	20.90	-	37486	150687	167423	1025.85	9369.3	Gravelly Run
Firestone	Hopewell	.58	-	-	2638	3245	1147	.013	252.2	Cattail Creek
Puremade	Hopewell	.029	-	-	2.6	7.38	3.070	.49	1104	Gravelly Run
Standard Paper	Richmond	-	3.00	-	2500	3750	5000	0	407.5	James
Vepco/Chesterfield	Chester	.0017	1078.68	-	-	-	-	-	-	James
Vepco/12th St.	Richmond	.0017	147.38	-	-	-	-	-	-	James
Standard Paper	Richmond	-	3.000	-	100	150	200	16.3	0	James River
Richmond Guano Co.	Richmond	.01	.02	-	5.4	15.0	216	3.5	4.8	James River
Reynolds Metals	Richmond	.241	-	.121	245	16	1345	.6	9.0	Proctors Creek

Large companies not listed because application has not been submitted, or application contains insufficient information, or application contains business confidential information include the following with effluent estimates by the Virginia Water Pollution Control Board.

	MGD	BOD
Federal Paper Board Company, Richmond, Virginia	2.75	3,740
American Tobacco Company, Bermuda Hundred	6.3	7,800
Virginia Wood Preserving Company, Richmond, Virginia		
Hercules Powder Company, Hopewell	25.0	39,540
E. I. DuPont de Nemours & Co., Inc.	33.4	4,400
Albemarle Paper, Richmond	.15	290

LOWER JAMES RIVER

Name	Location	Total Water Intake Daily (mgd)			Average Daily Discharge (pounds per day)					Discharge Pt.
		Municipal Or Private	Surface Water	Ground-water	B.O.D.	C.O.D.	Total Solids	Phosphorus	Nitrogen	
Atlantic Creosoting	Portsmouth	.05	.11	-	279	442.6	17037	.15	.57	So. Br. Eliz. River
B. P. Oil	Portsmouth	.001	(Rainfall)	.006	-	-		-	-	Paradise Creek
Dow Badische	Williamsburg	-	-	5.76	84	1952	47015	32	320.3	Wood Creek
Eberwine	Portsmouth	-	-	.02	-	-		-	-	Bennett Creek
S. Wallace Edwards	Surry	.005	-	-	-	-		-	-	Gray's Creek
Eppinger & Russell	Chesapeake	.03	.72	-	367	115	12891	0.1	2.1	So. Br. Eliz. River
ITT Gwaltney	Smithfield	-	-	.60	3000	4000	38000	230	100	Pagan Creek
Republic Creosoting	Chesapeake	.02	.15	-	66	250	21205	-	-	Elizabeth River
Royster	Norfolk	.01	.9	.01	-	-		-	-	So. Br. Eliz. River
Smith-Douglas	Norfolk	-	3.1968	.1970	138	10790	473529	133	74	So. Br. Eliz. River
Smithfield	Smithfield	-	-	.02	360	440	380	22.0	1.0	Pagan Creek
Smithfield Packing	Smithfield	-	-	1.000	6000	10000	21667	50	593	Pagan Creek
Swift	Chesapeake	.03	.79	.07	1	8	464	.35	1.56	Elizabeth River
Texaco	Chesapeake	1.0	.01	-	-	-		-	-	So. Br. Eliz. River
Veeco/Portsmouth	Norfolk	0.42	515.09	.15	-	-		-	-	Deep Creek & So. Br. Eliz. River
Veeco/Reeves	Norfolk	0.11	205.01	-	-	-		-	-	E. Br. Eliz. River
Veeco/ Surry	Surry	-	2314.00	.15	-	-		-	-	James
Virginia Chemical	Portsmouth	0.94	1.32	2.86	4600	8153.1		8.97	602.09	Elizabeth River
Weaver	Norfolk	.09	1.40	.20	-	-		-	-	So. Br. Eliz. River



# SEWAGE DISCHARGES

## LOWER JAMES

<u>Map Ref. Number<sup>1</sup></u>	<u>State Dis. Site No.</u>	<u>Name of Place</u>	<u>County/City</u>
48	20	Eastern State Hospital	James City County
49	12	Birchwood Utilities	James City County
50	70	City of Williamsburg	Williamsburg
51	19	Fort Eustis	Newport News
52	15	HRSDC Patrick Henry	Newport News
53	14	HRSDC James River System	Newport News
54	11	HRSDC Boat Harbor	Newport News
55	71	Town of Smithfield	Isle of Wight
56	6	Obici Memorial Hospital	Nansemond
57	69	City of Suffolk	Suffolk
58	3	East Suffolk Gardens	Nansemond
59	16	Frederick College	Nansemond
60	41	HRSDC Western Branch	Chesapeake
61	68	City of Portsmouth	Portsmouth
62	10	HRSDC Lambert Point	Norfolk
63	9	HRSDC Army Base	Norfolk
64	30	HRSDC Deep Creek #2	Chesapeake
65	31	HRSDC Washington	Chesapeake
66	40	State Convict Road Camp #22	Chesapeake
67	38	Great Bridge	Chesapeake
68	29	Carolanne Farms	Virginia Beach
69	64	HRSDC Chesapeake-Elizabeth Sys.	Virginia Beach
70	54	Virginia Beach-Lynnhaven Borough	Virginia Beach
71	56	Virginia Beach Borough	Virginia Beach

<sup>1</sup>See Fig. 19

# SEWAGE DISCHARGES

## MIDDLE JAMES

<u>Map Ref. Number</u>	<u>State Dis. Site No.</u>	<u>Name of Place</u>	<u>County/City</u>
1	29	St. Francis DeSales School	Powhatan
2	23	Beaumont School For Boys	Powhatan
3	24	State Farm For Women	Goochland
4	25	State Farm For Men (North)	Goochland
5	26	State Farm For Men (South)	Powhatan
6	28	Manakin Farms	Goochland
7	30	St. John Vianney Seminary	Goochland
8	73	West End Manor	Henrico
9	93	Oak Hill Estates	Hanover
10	94	F. & R. Oil Company	Hanover
11	45	Willow Oaks Country Club	Richmond
12	46	James River Lagoon	Richmond
13	39	Upper Powhite Creek	Chesterfield
14	40	Bon Air School For Girls	Chesterfield
15	38	Hustings Trailer Terrace	Chesterfield
16	41	Brighton Lagoon	Chesterfield
17	42	Buford Shopping Center	Chesterfield
18	43	State Police Headquarters	Chesterfield
19	47	White Boys Study Home	Richmond
20	100	City of Richmond	Richmond
21	78	Laburnum Manor	Henrico
22	85	Glenwood Farms	Henrico
23	86	Hechler Village	Henrico
24	83	Gillie Creek	Henrico
25	84	Lawndale Farm	Henrico
26	81	Highland Springs	Henrico
27	82	Sandston	Henrico
28	90	Byrd Airport	Henrico
29	48	Falling Creek S.T.P.	Chesterfield
30	60	Bellwood U.S. Government	Chesterfield
31	51	Bellwood	Chesterfield
32	52	Quail Oaks	Chesterfield
33	66	Reynolds Metals Company	Chesterfield
34	49	Chesterfield Court House	Chesterfield
35	35	State Convict Camp No. 13	Chesterfield
36	55	Chester Areg	Chesterfield
37	37	State Convict Camp No. 27	Dinwiddie
38	88	City of Petersburg	Petersburg
39	102	City of Colonial Heights	Colonial Heights
40	113	American Tobacco Company	Chesterfield
41	115	Allied Chemical	Hopewell
42	70	City of Hopewell	Hopewell
43	63	Hercules Inc.	Hopewell
44	59	Fort Lee	Prince George
45	68	Red Hill Trailer Court	Prince George
46	34	Amelia Sanitary District	Amelia
47	105	Town of Crew	Nottaway

MUNICIPAL AND INSTITUTIONAL WASTES DISCHARGES  
PLANNING DISTRICT 15  
DECEMBER 31, 1968

	1963 Estimated Population	1960 Estimated Population Served by Sewer	Percent of Population Served	Million Gallons of Waste Discharged Daily	Percent of Total Gallons Daily Receiving:				Percent of Total Gallons Receiving Chlorination
					No Treatment	Primary Treatment	Secondary Treatment	Tertiary Treatment	
TOTAL	569,021	393,864	69.2	38.315	0.0	83.4	16.0	0.0	98.6
Charles City	6,516	60	0.9	.006	0.0	0.0	100.0	0.0	0.0
Chesterfield	111,392	50,409	45.3	4.350	0.0	50.2	46.9	2.9	93.1
Goodland	10,466	4,305	41.1	.396	0.0	15.1	83.6	1.3	96.0
Hanover	36,163	4,825	18.8	.575	0.0	6.1	93.9	0.0	78.1
Henrico	160,600	136,270	84.9	13.394	0.0	78.1	20.2	1.7	99.7
New Kent	5,066	720	14.2	.016	0.0	0.0	100.0	0.0	0.0
Powhatan	8,076	1,275	15.8	.128	0.0	27.3	72.7	0.0	89.8
Coronia Heights	14,291	11,500	80.5	1.000	0.0	100.0	0.0	0.0	100.0
Richmond City	216,451	184,500	85.2	18.450	0.0	97.6	2.4	0.0	100.0

County or City	Community or Institution	1960 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Charles City	Barnett's School	60	.006	Secondary without Cl <sub>2</sub>	Herring Creek
Chesterfield	Allied Chemical Corp. Research Center	600	.060	Secondary with Cl <sub>2</sub>	Swift Creek
	American Tobacco Co. Hammes Div.	220	.022	Secondary with Cl <sub>2</sub>	James River
	Ashton Creek Plant	4,000	.400	Secondary with Cl <sub>2</sub>	Ashton Creek
	Baptist Negro Children's Home	50	.005	Secondary without Cl <sub>2</sub>	Church Branch
	Bellwood Depot	800	.080	Primary with Cl <sub>2</sub>	James River
	Bellwood Manor Plant	765	.053	Secondary with Cl <sub>2</sub>	Kingsland Creek to Proctor's Creek
	Bermuda Hundred National Aniline Co.	2,200	.220	Secondary with Cl <sub>2</sub>	James River
	Brighton Green Plant	1,775	.090	Secondary with Cl <sub>2</sub>	Powhatan Creek
	Bon-Air State Ind. School for Girls	250	.025	Secondary with Cl <sub>2</sub>	Powhatan Creek
	Buford Shopping Center	240	.024	Secondary with Cl <sub>2</sub>	James River
	Chester Plant	240	.024	Secondary with Cl <sub>2</sub>	Proctor's Creek
	Chesterfield Court House	85	.004	Secondary without Cl <sub>2</sub>	Proctor's Creek
	Convict Road Camp #13	120	.012	Tertiary with Cl <sub>2</sub>	Swift Creek
	Elon Plant	825	.039	Secondary with Cl <sub>2</sub>	The Brook

Source: Virginia Health Data Book, Office of Comprehensive Planning,  
Virginia State Department of Health, Edward E. Springboard,  
Director, March 10, 1970.

County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Chesterfield	Falling Creek Plant	22,600	2.260	Primary with Cl <sub>2</sub>	Guindal Creek to James River
	James River Lagoons	1,625	.074	Secondary with Cl <sub>2</sub>	James River
	Horrisdale San. Dist.	75	.008	Secondary without Cl <sub>2</sub>	James River
	Powhite Creek Plant	1,495	.090	Secondary with Cl <sub>2</sub>	Powhite Creek
	Quail Oaks Subdivision	910	.039	Secondary with Cl <sub>2</sub>	Proctor's Creek
	Reynolds Metals #1	200	.020	Secondary without Cl <sub>2</sub>	Proctor's Creek
	Reynolds Metals #2	336	.034	Secondary without Cl <sub>2</sub>	Proctor's Creek
	State Police Headquarters	100	.010	Secondary with Cl <sub>2</sub>	James River
	Upper Powhite Creek Plant	1,980	.198	Secondary with Cl <sub>2</sub>	Powhite Creek
	Va. Boy's Study Home	85	.009	Secondary with Cl <sub>2</sub>	Falling Creek
	Ettrick Sanitary Dist.	2,998	.300	Secondary with Cl <sub>2</sub>	Appomattox River
	Bensley Elem. School	605	.006	Primary without Cl <sub>2</sub>	
	Carver High School	545	.009	Secondary without Cl <sub>2</sub>	Piney Creek to Swift Creek
	Curtis Elem. School	710	.007	Secondary without Cl <sub>2</sub>	Swift Creek to Appomattox River
	E.H.S. Greene Elem. School	565	.006	Secondary without Cl <sub>2</sub>	Broad Rock Creek
	Midlothian High School	990	.020	Secondary without Cl <sub>2</sub>	Falling Creek
	O.S. Hastings High School	450	.045	Secondary without Cl <sub>2</sub>	Powhite Creek
	Raid Elem. School	1,270	.127	Secondary without Cl <sub>2</sub>	Pocoshook Creek to Falling Creek
	Waltham Hotel	200	.017	Secondary without Cl <sub>2</sub>	Ashton Creek to Appomattox River
	Willow Oaks Country Club	500	.013	Secondary without Cl <sub>2</sub>	Quarry Hole located near Powhite Creek
Colonial Heights	Colonial Heights	11,500	1.000	Primary with Cl <sub>2</sub>	Old Town Creek to Appomattox River to James River
Geochland	H.S. Bowles Trailer Camp	70	.006	Secondary without Cl <sub>2</sub>	Tuckahoe Creek
	Oak Hill Country Club	400	.010	Secondary without Cl <sub>2</sub>	Deer Pen Creek to Tuckahoe Creek
	State Farm for Men	600	.060	Primary with Cl <sub>2</sub>	Beaver Dam Creek

County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Goochland	Vinita St. John Vianney Sem.	85	.005	Tertiary with Cl <sub>2</sub>	James River
	Va. Industrial Farm for Women	750	.075	Secondary with Cl <sub>2</sub>	James River
Hanover	Manakin Farms, Inc.	2,400	.240	Secondary with Cl <sub>2</sub>	Little River
	Ashland	3,000	.350	Secondary with Cl <sub>2</sub>	Falling Creek
	Blue Star Estates	80	.036	Secondary with Cl <sub>2</sub>	Opossum Creek to Pamunkey River
	Country Club Hills Subdivision	55	.019	Secondary without Cl <sub>2</sub>	South Anna River
	Correctional Field Unit #14-A	125	.013	Secondary with Cl <sub>2</sub>	Pamunkey River
	Hanover Industrial School for Boys	350	.035	Primary with Cl <sub>2</sub>	Pamunkey River
	Janie Porter Barrett School for Girls	150	.015	Secondary with Cl <sub>2</sub>	Crumps Creek
	Oak Hill Estates	465	.047	Secondary without Cl <sub>2</sub>	Chickahominy River
	Bethany Elem. School	50	.005	Secondary without Cl <sub>2</sub>	South Anna River
	Center City Motel, Inc.	200	.020	Secondary without Cl <sub>2</sub>	Stoney Run to Chickahominy River
	Henry District High School	160	.016	Secondary without Cl <sub>2</sub>	Beaverdam to Chickahominy River
	West End High School	190	.019	Secondary without Cl <sub>2</sub>	Stag Creek to South Anna River
	Hechler Village	3,500	.225	Secondary with Cl <sub>2</sub>	Gillies Creek
Henrico	Wistar Farms James River Service Corp.	725	.038	Secondary with Cl <sub>2</sub>	Rocky Branch
	Laurel Links	40	.004	Secondary without Cl <sub>2</sub>	Hungary Creek
	Lawndale Farm	950	.162	Secondary with Cl <sub>2</sub>	Gillies Creek
	Sandston Sanitary District	4,730	.473	Secondary with Cl <sub>2</sub>	Chickahominy River
	West End Manor	2,665	.225	Tertiary with Cl <sub>2</sub>	Hungry Creek to Upham Brook
	Henrico Co. S.D. Plant A	50,580	5.058	Primary with Cl <sub>2</sub>	James River
	Henrico Co. S.D. Plant B	40,030	4.003	Primary with Cl <sub>2</sub>	James River
	Henrico Co. S.D. Plant C	3,090	.309	Secondary with Cl <sub>2</sub>	Chickahominy River
	Glenwood Farm Henrico Co. S.D. #10	960	.096	Primary with Cl <sub>2</sub>	James River

County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Henrico	Henrico Co. S.D. #3 (Gillies Creek Plant)	3,360	.399	Secondary with Cl <sub>2</sub>	Gillies Creek
	Henrico Co. S.D. #3 - Highland Springs	2,395	.240	Secondary with Cl <sub>2</sub>	Chickahominy River
	Henrico Co. S.D. #19	90	.009	Primary with Cl <sub>2</sub>	James River
	Laburnum Manor	1,650	.100	Secondary with Cl <sub>2</sub>	Chickahominy River Horse Swamp Creek
	Lakeside Brookland S. D. B	13,000	1.300	Primary with Cl <sub>2</sub>	James River
	Crestview Apts.	3,000	.300	Secondary with Cl <sub>2</sub>	Upham Brook
	Henrico Co. Laurel Park Plant #1	800	.080	Secondary with Cl <sub>2</sub>	Hungry Creek Upham Brook
	Henrico Co. Laurel Park Plant #2	140	.040	Secondary with Cl <sub>2</sub>	Upham Brook
	Henrico Co. Woodman Terrace Sub. Plant	100	.010	Secondary with Cl <sub>2</sub>	Hungry Creek Upham Brook
	Randolph Ridge Sub. Plant	110	.010	Secondary without Cl <sub>2</sub>	Brook Run to Chickahominy River
	George Baker Elem. School (Wilson Rd. Elem. School)	650	.007	Secondary without Cl <sub>2</sub>	Wilton Creek James River
	Glen Allen Apts.	50	.005	Secondary with Cl <sub>2</sub>	North Run to Chickahominy River
	Glen Allen Elem. School	90	.009	Secondary without Cl <sub>2</sub>	North Run to Upham Branch
	Glenwood Farms S.D. #7	2,500	.250	Secondary with Cl <sub>2</sub>	Chickahominy River
	Highland Springs School	N.A.	N.A.	Primary without Cl <sub>2</sub>	Chickahominy River
	Montross Elem. School	N.A.	N.A.	Secondary without Cl <sub>2</sub>	Gillies Creek
	Varina District Varina Jr. & Sr. High School	320	.032	Secondary with Cl <sub>2</sub>	Warm Springs Run
	Varina District Varina School	N.A.	N.A.	Secondary without Cl <sub>2</sub>	Open dry ditch
	Virginia Randolph School	705	.010	Secondary without Cl <sub>2</sub>	Chickahominy River
New Kent	Convict Road Camp #16	120	.012	Secondary without Cl <sub>2</sub>	Wahran Swamp
	G. W. Watkins School	600	.004	Secondary without Cl <sub>2</sub>	Chickahominy River

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County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Powhatan	Industrial School for Boys	350	.035	Primary with Cl <sub>2</sub>	Spring Branch to James River
	Saint Frances De Sales High School	125	.013	Secondary without Cl <sub>2</sub>	James River
	State Misdemeanant Farm	800	.080	Secondary with Cl <sub>2</sub>	James River
Richmond	Richmond City	180,000	18.000	Primary with Cl <sub>2</sub>	James River
	Byrd Field	4,500	.450	Secondary with Cl <sub>2</sub>	White Oak Swamp Chickahominy River

MUNICIPAL AND INSTITUTIONAL WASTES DISCHARGES  
PLANNING DISTRICT 19  
DECEMBER 31, 1968

	1968 Estimated Population	1968 Estimated Population Served by Saver	Percent of Population Served	Million Gallons of Waste Discharged Daily	Percent of Total Gallons Daily Receiving				Percent of Total Gallons Receiving Chlorination
					No Treatment	Primary Treatment	Secondary Treatment	Tertiary Treatment	
TOTAL	151,360	90,035	59.5	8.216	0.0	89.6	10.4	0.0	90.6
Dinwiddie	25,911	1,925	7.4	.122	0.0	41.0	59.0	0.0	36.9
Greenville	11,797	500	4.2	.050	0.0	100.0	0.0	0.0	100.0
Prince George	30,858	16,860	54.6	1.506	0.0	86.2	13.8	0.0	97.3
Surry	5,951	500	8.9	.005	0.0	0.0	100.0	0.0	0.0
Sussex	12,338	4,750	38.5	.283	0.0	93.6	6.4	0.0	56.5
Emporia	5,404	5,500	101.8	.550	0.0	0.0	100.0	0.0	0.0
Hopewell	21,157	20,000	94.5	2.000	0.0	100.0	0.0	0.0	100.0
Petersburg	37,944	40,000	105.4	3.700	0.0	100.0	0.0	0.0	100.0

County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Dinwiddie	Camelot Subdivision	450	.045	Secondary with Cl <sub>2</sub>	Lieutenant Run to James River
	Correctional Field Unit #27	150	.015	Secondary without Cl <sub>2</sub>	Whipponock Creek to James River
	McKenney	560	.050	Primary without Cl <sub>2</sub>	Buckskin Creek to Nottoway River
	South Fork High School	765	.012	Secondary without Cl <sub>2</sub>	Nottoway River
Greenville	Johns-Manville Corp.	500	.050	Primary with Cl <sub>2</sub>	Nottoway River to Chowan River

County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Prince George	Continental Can Co.	1,000	.100	Primary with Cl <sub>2</sub>	Gravelly Run to James River
	Federal Reformatory	1,000	.100	Secondary with Cl <sub>2</sub>	Appomattox River to James River
	Fort Lee	10,880	1.088	Primary with Cl <sub>2</sub>	Bailey Creek to James River
	Hercules Powder Co.	1,100	.110	Primary with Cl <sub>2</sub>	Bailey Creek to James River
	Oakhurst Subdivision	280	.028	Secondary with Cl <sub>2</sub>	Blackwater Creek to Chowan River
	Richard Bland College	400	.040	Secondary with Cl <sub>2</sub>	Second swamp of Blackwater River to Chowan River
	Rivers Edge Subdivision	200	.020	Secondary without Cl <sub>2</sub>	James River
	Blackwater Dist. High School	1,000	.010	Secondary without Cl <sub>2</sub>	Blackwater River to Chowan River
	Prince George Co. Elem. School	1,000	.010	Secondary without Cl <sub>2</sub>	Blackwater Swamp to Chowan River
Surry	Jackson Elem. School	500	.005	Secondary without Cl <sub>2</sub>	Blackwater River
Sussex	Jarratt	550	.030	Primary with Cl <sub>2</sub>	Nottoway River
	Wakefield	1,050	.105	Primary without Cl <sub>2</sub>	Wild Cat Swamp Blackwater River
	Waverly	1,350	.130	Primary with Cl <sub>2</sub>	Spring Branch to Chowan River
	Central High School	1,800	.018	Secondary without Cl <sub>2</sub>	Hunting Quarter Creek to Chowan River
Emporia	Emporia	5,500	.550	Secondary without Cl <sub>2</sub>	Meherrin River to Chowan River
Hopewell	Hopewell City	20,000	2.000	Primary with Cl <sub>2</sub>	Bailey's Creek to James River
Petersburg	Petersburg	40,000	3.700	Primary with Cl <sub>2</sub>	Appomattox River

Virginia Health Data Book

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR



MUNICIPAL AND INSTITUTIONAL WASTES DISCHARGES  
PLANNING DISTRICT 20  
DECEMBER 31, 1968

	1968 Estimated Population	1968 Estimated Population Served by Service	Percent of Population Served	Million Gallons of Waste Discharged Daily	Percent of Total Gallons Daily Receiving:				Percent of Total Gallons Receiving Chlorination
					No Treatment	Primary Treatment	Secondary Treatment	Tertiary Treatment	
TOTAL	772,352	640,812	83.0	65.212	0.0	72.5	25.9	1.6	99.3
Isle of Wight	18,989	3,150	16.6	.340	0.0	0.0	100.0	0.0	95.0
Nansemond	35,945	3,305	9.2	.317	0.0	0.0	100.0	0.0	100.0
Southampton	20,334	3,415	16.8	.202	0.0	0.0	100.0	0.0	90.1
Chesapeake	85,771	62,503	72.9	5.629	0.0	84.4	15.6	0.0	96.5
Franklin City	8,033	9,000	112.0	.900	0.0	0.0	100.0	0.0	100.0
Norfolk	305,585	330,130	108.0	33.178	0.0	93.9	6.1	0.0	100.0
Portsmouth	127,208	89,225	70.2	11.194	0.0	99.9	0.1	0.0	100.0
Suffolk	11,981	12,609	105.2	1.261	0.0	0.0	100.0	0.0	100.0
Virginia Beach	158,506	127,425	80.4	12.191	0.0	0.0	91.6	8.4	98.3

County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Isle of Wight	Convict Road Camp #3	120	.012	Secondary without Cl <sub>2</sub>	Blackwater River
	Pinewood Heights	400	.040	Secondary with Cl <sub>2</sub>	Tributary to Pagan Creek
	Smithfield	1,500	.175	Secondary with Cl <sub>2</sub>	Holly Creek to Pagan River
	Smithfield Packing Co.	800	.080	Secondary with Cl <sub>2</sub>	Pagan River
	Jersey Park East Homes	50	.005	Secondary without Cl <sub>2</sub>	Holly Creek to Pagan River
	George Tyler Elem. School	110	.011	Secondary with Cl <sub>2</sub>	Lake Prince
	Hardy Elem. School	70	.007	Secondary with Cl <sub>2</sub>	Tormentors Creek
	Windsor High School Addition	100	.010	Secondary with Cl <sub>2</sub>	Lake Prince
Nansemond	East Suffolk Gardens	400	.027	Secondary with Cl <sub>2</sub>	Shingle Creek
	Louise Deici Hospital	1,050	.105	Secondary with Cl <sub>2</sub>	Nansemond River
	Tidewater Community College	1,400	.140	Secondary with Cl <sub>2</sub>	Nansemond River
	Wynnewood Subdivision	455	.045	Secondary with Cl <sub>2</sub>	Knotts Creek to Nansemond River
Southampton	Boykins	845	.085	Secondary with Cl <sub>2</sub>	Tarrama Creek to Maherrin River

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County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Southampton	Edgenill Subdivision	110	.011	Secondary with Cl <sub>2</sub>	Blackwater River
	Convict Road Camp #20	100	.010	Secondary with Cl <sub>2</sub>	Nottoway River to Blackwater River
	Southampton State Farm	760	.076	Secondary with Cl <sub>2</sub>	Three Creeks
	Berlin-Ivor School	400	.004	Secondary without Cl <sub>2</sub>	Semcock Swamp to Blackwater River
	Boykins Elem. School	400	.004	Secondary without Cl <sub>2</sub>	Tarrama Creek Meherrin River
	Capron Elem. School	400	.004	Secondary without Cl <sub>2</sub>	Nottoway River
	Southampton Co. Training School	400	.008	Secondary without Cl <sub>2</sub>	Nottoway River
Chesapeake (South Norfolk & Norfolk Counties)	Deep Creek Plant #2	2,000	.200	Secondary with Cl <sub>2</sub>	St. Julian's Creek to Elizabeth River
	Washington (Dozier's Corner Plant)	5,000	.500	Primary with Cl <sub>2</sub>	South Branch of Elizabeth River
	Great Bridge Plant	2,500	.250	Primary with Cl <sub>2</sub>	South Branch of Elizabeth River
	Western Branch Plant	20,000	2.000	Primary with Cl <sub>2</sub>	West Branch of Elizabeth River
	Norfolk Prison Farm	900	.090	Secondary without Cl <sub>2</sub>	Northwest River to Currituck Sound
	Convict Road Camp #22	120	.012	Secondary without Cl <sub>2</sub>	East Branch of Elizabeth River
	Tidewater Utilities	2,730	.273	Secondary with Cl <sub>2</sub>	Broad Creek to Elizabeth River
	Churchland High School	1,000	.019	Secondary without Cl <sub>2</sub>	Western Branch of Elizabeth River
	Deep Creek High School	750	.005	Secondary without Cl <sub>2</sub>	Deep Creek
	Deep Creek Elem. School	800	.008	Secondary without Cl <sub>2</sub>	Deep Creek
	Elizabeth Manor Elem. School	700	.007	Secondary without Cl <sub>2</sub>	Western Branch of Elizabeth River
	Great Bridge School #1	250	.030	Secondary without Cl <sub>2</sub>	Elizabeth River
	Great Bridge School #2	720	.001	Primary with Cl <sub>2</sub>	Chesapeake and Albemarle Canal
	Southeastern Elem. School	800	.008	Secondary without Cl <sub>2</sub>	Drainage Ditch
	Tuckers Rest	33	.004	Secondary without Cl <sub>2</sub>	St. Julians Creek to Elizabeth River
	Washington Elem. School	900	.009	Secondary with Cl <sub>2</sub>	Eastern Branch of Elizabeth River

Virginia Health Data Book

County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Chesapeake (South Norfolk & Norfolk Counties)	South Norfolk	22,000	2.200	Primary with Cl <sub>2</sub>	Potash Creek
	South Norfolk City G. W. Carver High School	1,300	.013	Secondary without Cl <sub>2</sub>	E. Branch of Elizabeth River
Norfolk	Army Base	95,000	9.500	Primary with Cl <sub>2</sub>	Hampton Roads
	Lambert's Point Plant	213,000	21.500	Primary with Cl <sub>2</sub>	Hampton Roads
	Poplar Hills Plants, #1 & #2	3,200	.320	Secondary with Cl <sub>2</sub>	Broad Creek to Elizabeth River
	Foundation Park Plants, #1 & #2	16,400	1.600	Secondary with Cl <sub>2</sub>	Indian River
	Chesapeake Manor, Inc.	1,000	.100	Secondary with Cl <sub>2</sub>	Lafayette River
	Norfolk Norview	1,500	.150	Primary with Cl <sub>2</sub>	Potash Creek
	Abby's Trailer Court	80	.008	Secondary without Cl <sub>2</sub>	Tanner's Creek to Elizabeth River
Portsmouth	Craddock	6,000	.600	Primary with Cl <sub>2</sub>	Elizabeth River
	Portsmouth	80,400	10.310	Primary with Cl <sub>2</sub>	Elizabeth River
	Westhaven Sanitary District	2,125	.277	Primary with Cl <sub>2</sub>	Elizabeth River
	Minosa Elem. School	700	.007	Secondary with Cl <sub>2</sub>	Elizabeth River
Virginia Beach (Princess Anna County)	Thalia Manor Birchwood Gardens #1 and #2	8,000	.800	Tertiary with Cl <sub>2</sub>	Lynnhaven River
	Cardinal Estates	1,368	.137	Tertiary with Cl <sub>2</sub>	Lynnhaven River
	Carolanne Farms #1 & #2	7,600	.760	Secondary with Cl <sub>2</sub>	East Elizabeth River
	Dam Neck #1 and #2	3,000	.300	Secondary with Cl <sub>2</sub>	Lake Tecumseh
	Chesapeake-Elizabeth System	80,000	8.000	Secondary with Cl <sub>2</sub>	Hampton Roads
	Gunn Hall Manor	407	.041	Secondary with Cl <sub>2</sub>	Malbon Swamp, Redwing Lake, Lake Tecumseh
	NAS, Oceana	5,000	.500	Secondary with Cl <sub>2</sub>	London Bridge Creek
	Princess Anne	1,900	.190	Secondary without Cl <sub>2</sub>	E. Branch Elizabeth River
	Lakeville	600	.060	Tertiary with Cl <sub>2</sub>	E. Branch Elizabeth River
	White Heron	120	.012	Secondary with Cl <sub>2</sub>	Great Neck Creek

Virginia Health Data Book

County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Virginia Beach (Princess Anne County)	Aragona Village #1 & #2	6,000	.600	Secondary with Cl <sub>2</sub>	Lynnhaven River
	Aragona Village #3	4,450	.450	Secondary with Cl <sub>2</sub>	Lynnhaven River
	Kempville Manor	170	.017	Secondary with Cl <sub>2</sub>	Elizabeth River
	Point O'Woods Subdivision	215	.021	Tertiary with Cl <sub>2</sub>	Lynnhaven River
	Princess Anne Plaza	2,100	.210	Secondary with Cl <sub>2</sub>	London Bridge Creek
	Court House Elem. School	500	.005	Secondary with Cl <sub>2</sub>	West Neck Creek to Currituck Sound
	Davisville Trailer Court	120	.012	Secondary with Cl <sub>2</sub>	Wolfsbane Creek to Lynnhaven Bay
	Del Mar Trailer Park Shore Drive	135	.014	Secondary with Cl <sub>2</sub>	Little Creek
	East Little Creek Elem. School	800	.008	Secondary with Cl <sub>2</sub>	Thalia Creek to W. Branch Lynnhaven River
	Holmes Convalescent Home	60	.006	Secondary with Cl <sub>2</sub>	Thalia Creek Lynnhaven River
	Kempville Elem. School	1,030	.010	Secondary without Cl <sub>2</sub>	Elizabeth River
	Meadows Elem. School	800	.008	Secondary with Cl <sub>2</sub>	Elizabeth River
	Linkhorn Park Elem. School	800	.008	Secondary with Cl <sub>2</sub>	Linkhorn Bay
	Little Creek Elem. School	600	.006	Secondary without Cl <sub>2</sub>	Little Creek
	Northeast Junior High School and John B. Day Elem. School	1,500	.015	Secondary with Cl <sub>2</sub>	Cedar Creek to Brook Cove to Lynnhaven Bay
	Saint Gregory's R.C. Parish Church and School	100	.001	Secondary without Cl <sub>2</sub>	Eastern Branch Elizabeth River
Franklin	Franklin	9,000	.900	Secondary with Cl <sub>2</sub>	Blackwater River
Suffolk	Suffolk	12,609	1.261	Secondary with Cl <sub>2</sub>	Nansemond River

Virginia Health Data Book

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

MUNICIPAL AND INSTITUTIONAL WASTES DISCHARGES  
PLANNING DISTRICT 21  
DECEMBER 31, 1968

	1968 Estimated Population	1968 Estimated Population Served by Sewer	Percent of Population Served	Million Gallons of Waste Discharged Daily	Percent of Total Gallons Daily Receiving:				Percent of Total Gallons Receiving Chlorination
					No Treatment	Primary Treatment	Secondary Treatment	Tertiary Treatment	
TOTAL	316,445	264,215	83.5	31.134	0.0	66.6	33.4	0.0	98.6
James City	16,016	1,660	10.4	.160	0.0	37.5	62.5	0.0	70.0
York	32,533	3,360	10.3	.324	0.0	0.0	100.0	0.0	100.0
Hampton*									
Newport News	257,005	248,520	96.7	29.699	0.0	69.6	30.4	0.0	99.8
Williamsburg	10,891	10,675	98.0	.951	0.0	0.0	100.0	0.0	100.0

\* Included in Newport News figures.

County or City	Community or Institution	1968 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree or Treatment	Discharges to
James City	Birchwood Estates	400	.040	Secondary with Cl <sub>2</sub>	College Creek
	Toano	180	.012	Primary with Cl <sub>2</sub>	France Swamp to Ware Creek to York River
	Eastern State Hospital Dunbar Farms	600	.060	Secondary with Cl <sub>2</sub>	Chisel Creek
York	Jamestown District Glass House Point	480	.048	Primary without Cl <sub>2</sub>	James River
	York Co. San. District	3,200	.308	Secondary without Cl <sub>2</sub>	Whitman Swamp Kings Creek
	Consolidated School	110	.011	Secondary without Cl <sub>2</sub>	Yorktown Creek York River
	Magruder Elem. School	50	.055	Secondary without Cl <sub>2</sub>	Queens Creek
Newport News Hampton (Buckroe Beach)	Hampton HRSD Boat Harbor Plant	72,000	6.408	Primary with Cl <sub>2</sub>	James River
	Newport News HRSD Boat Harbor Plant	118,000	10.592	Primary with Cl <sub>2</sub>	James River
	HRSD James River Plant	15,000	1.800	Secondary with Cl <sub>2</sub>	Warwick River to James River
	Fort Eustis	29,500	2.950	Primary with Cl <sub>2</sub>	James River
	HRSD Patrick Henry Plant	1,500	.700	Primary with Cl <sub>2</sub>	Potash Creek to Lucas Creek
	Buckroe Beach	(1,977)	(.198)	Primary with Cl <sub>2</sub>	James River
	Newport News Denbigh	10,800	1.080	Secondary with Cl <sub>2</sub>	Stoney Run to Warwick River
	Lee Hall	740	.074	Secondary without Cl <sub>2</sub>	Skiff Creek to James River

Virginia Health Data Book

County or City	Community or Institutions	1960 Estimated Population Served	Average Daily Flow (M.G.D.)	Degree of Treatment	Discharges to
Newport News Hampton (Buchroo Beach)	Stoneybrook Estates	730	6.070	Secondary with Cl <sub>2</sub>	Warwick River to James River
	Newport News City Farm	150	.015	Primary with Cl <sub>2</sub>	James River
	Newport News Reservoir School	100	.010	Secondary with Cl <sub>2</sub>	Warwick River to James River
Williamsburg	Williamsburg City	9,375	.938	Secondary with Cl <sub>2</sub>	College Creek to James River
	Williamsburg Colonial Capitol Motel	1,300	.013	Secondary with Cl <sub>2</sub>	Queens Creek to Rappahannock River

\*Included in Newport News HRSD Boat harbor Plant Totals.

Virginia Health Data Book

## VIRGINIA FERTILIZER CONSUMPTION REPORT BY COUNTY

Fertilizer sales are quite accurate. Monthly reports are submitted to the Department of Agriculture. The annual figures are published and available to the general public. These figures are broken down by composition, each element and method of delivery (bag, bulk or liquid) for each county. The accompanying tables present the nutrient values only and do not reflect total tonnage which would include a large percentage of inert carriers in the case of artificial fertilizers.

Sales not recorded would be those of major chain stores purchasing their stock, outside Virginia as well as small retailers making purchases from similar sources.

Source: Virginia Department of Agriculture, Division of Regulatory Services, Fertilizer Used & Results of Inspection, Virginia, 1969-1970-1971

VIRGINIA FERTILIZER CONSUMPTION REPORT BY COUNTY  
July 1, 1970 - June 30, 1971  
Nutrients In Tons

COUNTY	Nitrogen	Phosphate	Potash	Total Nutrients	Cropland Acres	Total Nutrients lbs. Per Acre
Charles City	375.59	313.84	407.91	1,097.34	14,466	151.71
Chesterfield	1,042.05	751.26	1,044.12	2,837.43	56,840	99.84
Dinwiddie	1,344.56	1,147.68	1,564.51	4,056.75	42,980	188.77
Goochland	460.91	487.77	495.68	1,444.36	30,604	94.39
Greensville	1,370.15	1,267.48	1,968.06	4,605.69	35,851	256.94
Hanover	1,330.16	1,018.59	1,193.85	3,542.60	58,608	120.89
Henrico	955.99	895.61	794.05	2,645.65	19,804	267.18
Isle of Wight	2,259.81	1,848.16	2,907.18	7,015.21	51,421	272.85
James City	264.95	219.83	271.67	756.45	10,349	146.19
Nansemond	1,948.91	1,453.32	2,591.24	5,993.47	56,900	210.67
New Kent	964.53	569.72	697.49	2,231.74	13,487	330.95
Powhatan	266.13	312.91	328.32	907.36	17,979	110.94
Prince George	363.54	379.68	535.06	1,278.28	29,649	87.23
Southampton	2,967.09	2,897.53	3,938.76	9,803.38	101,281	193.59
Surry	1,009.24	835.57	1,463.89	3,308.70	34,253	193.19
Sussex	1,156.00	951.27	1,348.30	3,455.57	45,501	151.89
York	102.87	101.35	123.24	327.46	6,233	105.07
			TOTAL	55,307.44	625,906	



VIRGINIA FERTILIZER CONSUMPTION REPORT BY COUNTY

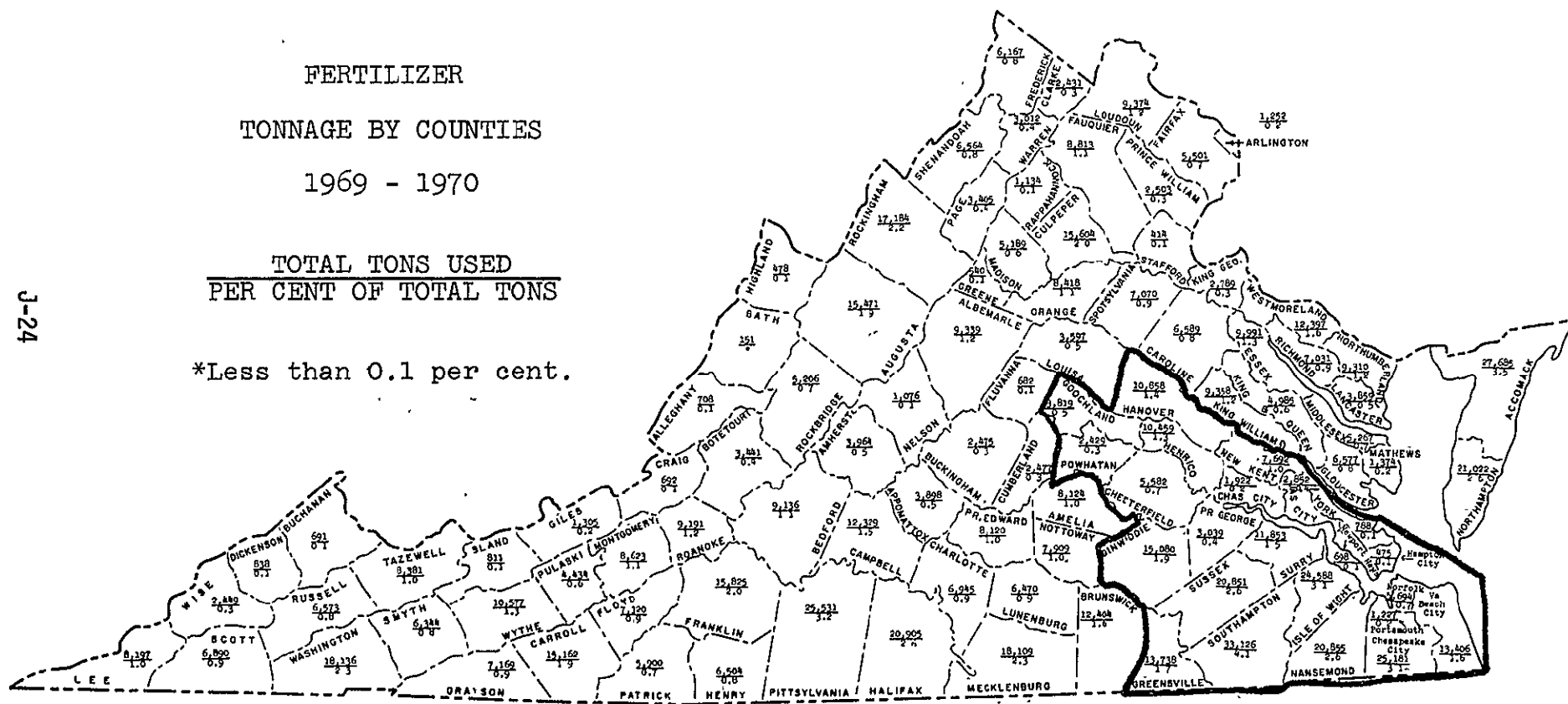
July 1, 1969 - June 30, 1970

Nutrients In Tons

COUNTY	Nitrogen	Phosphate	Potash	Total Nutrients	Cropland Acres	Total Nutrients lbs. Per Acre
Charles City	196.59	155.29	239.56	591.44	14,466	81.77
Chesterfield	785.70	536.27	552.99	1,874.96	56,840	65.97
Dinwiddie	1,224.44	1,200.61	1,709.66	4,134.71	42,980	192.40
Goochland	365.02	432.10	429.54	1,226.66	30,604	80.16
Greensville	913.66	907.87	1,651.54	3,473.07	35,851	193.75
Hanover	1,225.28	997.41	1,147.80	3,370.49	58,608	115.02
Henrico	877.01	1,216.58	1,064.64	3,158.23	19,804	318.95
Isle of Wight	1,851.85	1,571.92	2,707.99	6,131.76	51,421	238.49
James City	258.35	229.50	275.22	763.07	10,349	147.47
Hansemond	1,650.25	1,317.90	2,238.27	5,206.42	56,900	183.00
New Kent	990.55	650.08	831.39	2,472.02	13,487	366.58
Powhatan	218.97	252.88	257.88	729.73	17,979	81.18
Prince George	223.23	225.86	350.35	799.44	29,649	53.93
Southampton	2,471.68	2,661.32	3,830.66	8,963.66	101,281	177.01
Surry	747.50	813.71	1,384.44	2,945.65	34,253	171.99
Sussex	1,313.30	1,670.50	2,539.24	5,523.04	45,501	242.77
York	98.10	58.77	58.40	215.27	6,233	69.07
			TOTAL	51,579.62	625,906	

## 3-24

\*Less than 0.1 per cent.



## PESTICIDES

In 1948 the Commonwealth of Virginia enacted the Virginia Pesticide Law. This law required the producer to register his label prior to sales. The act also provided for a monitoring system by which agency personnel measure concentration and content against declaration or statements made upon the label. In 1971 a new regulation (23) was added to the Virginia Pesticide Law. It called for registration and sales monitoring in a number of named pesticides. An application for a sales permit follows this introduction.

Pesticide sales records will not be combined into an annual report or other tabulations. The retailer will only keep records for on-site inspection and inventory control. Furthermore, they will not be inspected by other than an agent of the Pesticide Regulatory Section.

Since this is the only sales recording of pesticides, it seems that no figures will result from existing sources. Best available figures will have to come from normal crop applications, crop production figures, estimates of professional uses and also domestic consumption. The variables in this would appear to make the task too great for the reward of generating the number.

It should also be noted that many seeds are treated with some of the regulated pesticides, particularly grass seed. Several brands use diel-drin to protect the seed until germination. The release of this pesticide into the environment will not be measured by this regulation as it now stands.

Source: Department of Agriculture & Commerce, Pesticide Regulatory Sec.,  
P.O. Box 1163, Richmond, Va. 23209, Harry K. Rust, Ass. Supervisor.



Virginia Department of Agriculture and Commerce  
Box 1163  
Richmond, Virginia 23219

APPLICATION FOR REGISTRATION AND PERMIT TO SELL

Name of Business \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Name of Owner or Manager \_\_\_\_\_

Business Telephone \_\_\_\_\_

The above applicant hereby applies for registration and permit to sell one or more of the following pesticides as authorized by Regulation 23 under the Virginia Pesticide Law:

ALDRIN-DDT-DIELDRIN-ENDRIN-HEPTACHLOR

The applicant agrees to maintain an inventory record of these pesticides showing the inventory on July 1, 1971, or date of this application. This inventory shall also show all receipts of these pesticides received after this date.

In addition, the applicant agrees to maintain a ledger of sales showing date of each sale, quantity, name of pesticide, name and address of the person to whom each sale is made, and intended use of each pesticide sold. The applicant further agrees to make available to the Commissioner or his authorized agent, all information contained in the inventory record or ledger of sales.

Signature of Owner or Manager \_\_\_\_\_

Date \_\_\_\_\_

County \_\_\_\_\_

This certifies that the above applicant is properly registered and permitted to sell the above pesticides until revoked by the Commissioner or otherwise cancelled for just cause.

Effective Date of Registration and Permit \_\_\_\_\_

Signature of Authorized Agent \_\_\_\_\_

Authorized By \_\_\_\_\_

Arthur T. Hart, Supervisor  
Pesticide Regulatory Section

Telephone 770-3798

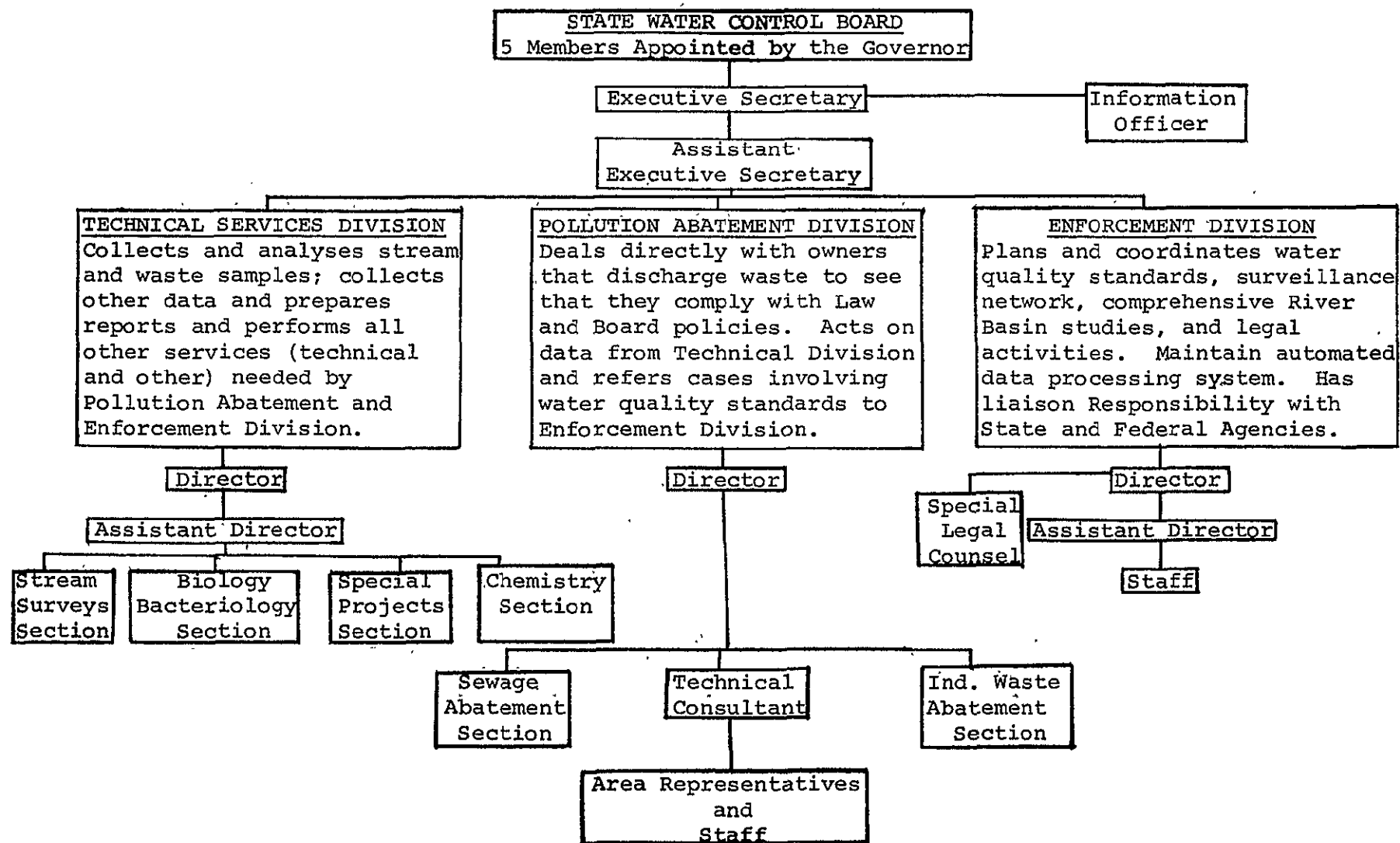
# SUGGESTED SALES LEDGER FORM

July 5, 1971

40-25#	25% DDT	G. W. Farmrite	Growmore, VA	Soybeans
2-50#	5% Aldrin	E. S. Seedy	Seedsboro, VA	Seed Treatment
1-30 gal.	Endrin	A. P. Appleway	Orchard, VA	Orchard Mouse Control

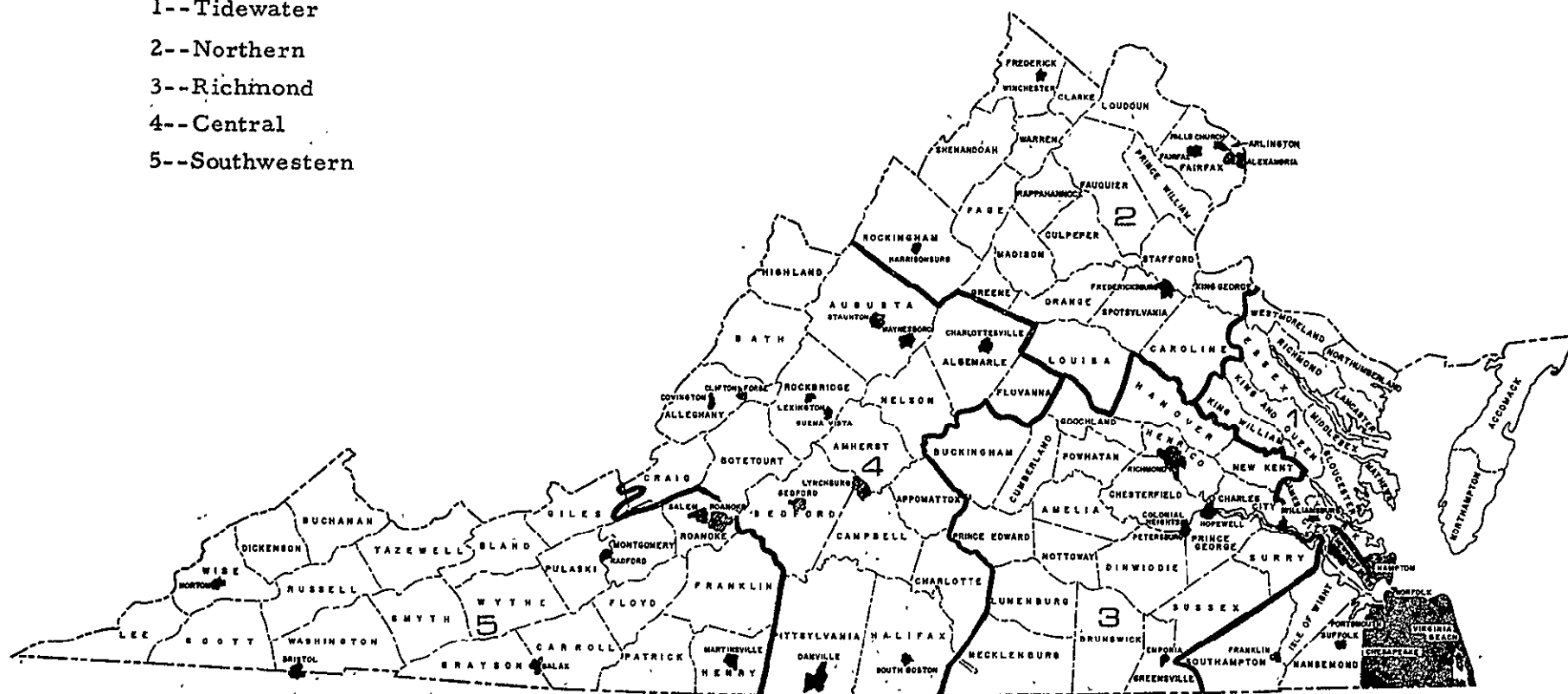
July 8, 1971

8-1 gal.	Dieldrite	Ace Pest Control	Termville, VA	Termite Control



Organization of Virginia State Water Control Board (1969)

- 1--Tidewater
- 2--Northern
- 3--Richmond
- 4--Central
- 5--Southwestern



State Water Control Board  
Administrative Regions

COMMONWEALTH OF VIRGINIA  
WATER QUALITY STANDARDS\*

1.00 RULES WITH GENERAL STATE-WIDE APPLICATION

- 1.01 All waters within this State shall at all times be free from all substances attributable to sewage, industrial wastes, or other wastes in concentrations or combinations which contravene established standards or interfere directly or indirectly with beneficial uses of such waters; except that limited zones will be permitted for the mixture of treated sewage, treated industrial wastes, and other waste effluents with receiving waters. The boundaries of mixing zones will be determined on a case by case basis. However, these zones shall generally occupy as small an area and length as possible, and shall not prevent free passage of fish or cause fish mortality.
- 1.02 Stream standards will apply whenever flows are equal to, or greater than, the minimum mean 7-consecutive day drought flow with a 10-year return frequency.
- 1.03 In lakes and impoundments the temperature of the epilimnion, in those areas where important organisms are most likely to be adversely affected, shall not be raised more than 3°F, above that which existed before the addition of heat of artificial origin. The increase is to be based on the monthly average of the maximum daily temperature. Unless a special study shows that a discharge of heated effluent into the hypolimnion (or pumping water from the hypolimnion for discharging back into the same water body) will not produce adverse effects, such practice shall not be approved. Maximum temperatures consistent with the standards established for waters immediately above and below the lake or impoundment will be established for these waters.
- 1.04 Any tributary stream which is not named in a specific section description, or otherwise, shall carry the same classification and standards of quality assigned to the stream or section to which it is tributary.
- 1.05 In addition to other standards established for the protection of public or municipal water supplies, the following standards will apply at the raw water intake point:

<u>Constituent</u>	<u>Concentration</u>
<u>Physical:</u>	
Color (color units)	75
<u>Inorganic Chemicals</u>	
Alkalinity	30-500

\* Text provided by the Virginia State Water Control Board



<u>Inorganic Chemicals (con't)</u>	<u>mg/l (con't)</u>
Arsenic	0.05
Barium	1.0
Boron	1.0
Cadmium	0.01
Chloride	250
Chromium, hexavalent	0.05
Copper	1.0
Fluoride	1.7
Iron (filterable)	0.3
Lead	0.05
Manganese (filterable)	0.05
Nitrates plus nitrites	10 (as N)
Selenium	0.01
Silver	0.05
Sulfate	250
Total dissolved solids	500
(filterable residue)	
Uranyl ion	5
<u>Organic Chemicals</u>	<u>mg/l</u>
Carbon chloroform extract (CCE)	0.15
Cyanide	0.20
Methylene blue active substances	0.5
Pesticides:	
Aldrin	0.017
Chlordane	0.003
DDT	0.042
Dieldrin	0.017
Endrin	0.001
Heptachlor	0.018
Heptachlor epoxide	0.018
Lindane	0.056
Methoxychlor	0.035
Organic phosphates plus Carbamates	0.1
Toxaphene	0.005
Herbicides:	
2, 4-D plus 2,4,5-T, plus 2, 4,5-TP	0.1
Phenols	0.001
<u>Radioactivity:</u>	<u>pc/l</u>
Gross beta	1,000
Radium-226	3
Strontium-90	10

2.00 RULES WITH SPECIFIC APPLICATION BASED ON CLIMATE, GEOGRAPHICAL AREA, OR USES

2.01 Primary Classification of Waters Within the State

MAJOR CLASS	GEOGRAPHICAL AREA or OTHER DESCRIPTION of WATERS	DISSOLVED OXYGEN mg/l		pH	TEMPERATURE °F	
		Minimum	Daily Average		Rise above Natural	Maximum
I	Open Ocean (Seaside of the Land Mass)	5.0	--	6.0-8.5	4.0(Sept.-May) 1.5(June-Aug.)	--
II	Estuarine (Tidal Water - Coastal Zone to Fall Line)	4.0	5.0	6.0-8.5	4.0(Sept.-May) 1.5(June-Aug.)	-- --
III	Free Flowing Streams (Coastal Zone and Piedmont Zone to the Crest of the Mountains)	4.0	5.0	6.0-8.5	5	90
IV	Mountainous Zone	4.0	5.0	6.0-8.5	5	87
V	Put and Take Trout Waters	5.0	6.0	6.0-8.5	--	70
VI	Natural Trout Waters	6.0	7.0	6.0-8.5	--	70

2.02 Subclasses to Complement Major Water Class Designations

Subclass A

Waters generally satisfactory for use as public or municipal water supply, secondary contact recreation, propagation of fish and aquatic life, and other beneficial uses.

Coliform Organisms - Fecal coliforms (multiple-tube fermentation or MF count) not to exceed a log mean of 1000/100 ml. Not to equal or exceed 2000/100 ml. in more than 10% of samples.

Monthly average value not more than 5000/100 ml. (MPN or MF count). Not more than 5000 MPN/100 ml. in more than 20% of samples in any month. Not more than 20,000/100 ml. in more than 5% of such samples.\*

Subclass B

Waters generally satisfactory for use as public or municipal water supply, primary contact recreation (prolonged intimate contact; considerable risk of ingestion), propagation of fish and other aquatic life, and other beneficial uses.

Coliform Organisms - Fecal coliforms (multiple-tube fermentation or MF count) within a 30 day period not to exceed a log mean of 200/100 ml. Not more than 10% of samples within a 30-day period will exceed 400/100 ml.

Monthly average not more than 2400/100 ml. (MPN or MF count). Not more than 2400/100 ml. in more than 20% of samples in any month. Not applicable during, nor immediately following periods of rainfall.\*

- \* With the exception of the coliform standard for shellfish waters, the enforceable standards will be those pertaining to fecal coliform organisms. The MPN concentrations are retained as administrative guides for use by water treatment plant operators.

2.03 Discharges of treated wastes, while not contravening established standards for shellfish waters may prevent the direct marketing of shellfish beds as a result of judgment factors employed by the State Department of Health. When the possibility of such condemnation arises as the result of proposals to discharge treated wastes, the Board will convene a public hearing to determine the socio-economic effect of the proposal before reaching a decision.

2.04 Samples for determining compliance with standards established for estuarine or open ocean waters will be collected at slack before flood tide or slack before ebb tide.

2.05 In open ocean or estuarine waters in specific areas where leased private or public shellfish beds are present, the following standard for coliform organisms will supplement the standard for Subclass A or B waters:

Not more than 70/100 ml of coliform organisms.  
Not more than 10% of the samples ordinarily greater than 230/100 ml (5-tube decimal dilution), or 330/100 ml (3-tube decimal dilution). Not to be so contaminated by radionuclides, pesticides, herbicides, or fecal material so that consumption of the shellfish might be hazardous.

### 3.00 Variance in Standards

3.01 The above standards notwithstanding, as a result of natural conditions, water quality may from time to time vary from established limits.

3.02 In accordance with the authority granted under Section 62.1-44.15 (3a) of the State Water Control Law, Chapter 3.1, Title 62.1 Code of Virginia 1950 As Amended by the 1970 General Assembly, the Board reserves the right at any time to modify, amend, or cancel any of the rules, policies, or standards set forth above.

### 4.00 Application of Standards

4.01 Based on climate, geographical location, or type (tidal, free-flowing, etc.), all waters will be assigned a major class I - VI and a subclass A or B, to indicate the appropriate coliform standard. Waters used for primary contact recreation will be assigned subclass B. All other waters will be assigned subclass A and will be suitable for secondary contact recreation and for use as a public water supply.

- 4.02 All water supplies will be assigned the standard for protection of water supplies set forth in 1.05. In shellfishing areas, those waters over and adjacent to shellfish beds will be assigned a major class, the appropriate subclass, and the special shellfish standard set forth in 2.05.
- 4.03 All waters within this State will be satisfactory for fishing and secondary contact recreation.

Section	Basin and Section Description	Class	Special Standards
JAMES RIVER BASIN (LOWER) (10)			
1	James River and its tidal tributaries from Old Point Comfort -- Fort Wool to Barrett Point (Buoy 64), except prohibited or spoil areas, unless otherwise designated.	II B	a
1a	The free flowing or non-tidal portions of streams in section 1 unless otherwise designated.	III B	s
1b	Eastern Branch of the Elizabeth River from its confluence with the Elizabeth River to end of navigable waters.	II B	a, h, i
1c	Free flowing portions of the Eastern Branch of the Elizabeth River.	III B	h, i
1d	Southern Branch of the Elizabeth River from its confluence with the Elizabeth River to the lock at Great Bridge.	II B	a
1e	Free flowing portions of the Western Branch of the Elizabeth River and of the Southern Branch of the Elizabeth River from its confluence with the Elizabeth River to the lock at Great Bridge.	III B	
1f	The Nansemond River and its tributaries from its confluence with the James River to Suffolk (dam at Lake Meade), unless otherwise designated.	II B	a, i
1g	Shingle Creek from its confluence with the Nansemond River to its headwaters in the Dismal Swamp.	III B	1
1h	Lake Prince, Lake Burnt Mill and Western Branch impoundments for Norfolk raw water supplies and Lake Kilby -- Cahoon Pond and Lake Meade impoundment for Portsmouth raw water supply.	III B	b Public Water Supply
1i	Free flowing portions of Pagan River and its free flowing tributaries.	III B	
1j	Chisel Run and its tributaries, except that tributary into which Eastern State Hospital discharges, to their headwaters.	III B	s
JAMES RIVER BASIN (MIDDLE)			
2	The James River and its tidal tributaries from Buoy 64 near Barrett's Point upstream to the fall line at Richmond, to include the Chickahominy River and its tidal tributaries from the mouth	II B	

Section	Basin and Section Description	Class	Special Standards
	upstream to Walker's Dam and the Appomattox River and its tidal tributaries from the mouth upstream to the head of tidal waters (approximately at the route 1 - 301 Bridge across the Appomattox), unless otherwise designated.		
2a	James River from City Point to a point 5 miles above American Tobacco Company's raw water intake and the Appomattox River from Hopewell's raw water intake to a point 5 miles upstream.	II B	Public Water Supply
2b	Free flowing tributaries to section 2a.	III B	Public Water Supply
3	Free flowing tributaries of the James River from Buoy 64 to Brandon and free flowing tributaries of the Chickahominy River to Walker's Dam, unless otherwise designated.	III B	
3a	Diascund Creek from Newport News' raw water intake dam to its headwaters.	III B	Public Water Supply
4	The Chickahominy River and its tributaries from Walker's Dam to Bottoms Bridge (route 60 Bridge)	III A	j
4a	Chickahominy River from Walker's Dam to a point 5 miles upstream	III A	Public Water Supply j
5	Chickahominy River and its tributaries, unless otherwise designated, from Bottom's Bridge (route 60 Bridge) to its headwaters.	III A	k
5a	Brandy Branch (a tributary to Beaverdam Creek)	III B	k
5b	Unnamed tributary to Lickinghole Creek which has its confluence 1.38 miles above the mouth of Lickinghole Creek.	III B	k
6	Appomattox River from the head of tidal waters, and free flowing tributaries to the Appomattox River, to their headwaters, unless otherwise designated.	III A	
6a	Swift Creek and its tributaries from Colonial Heights' raw water intake to a point 5 miles upstream.	III B	Public Water Supply
6b	Swift Creek and its tributaries from the dam at Pocahontas State Park upstream to Chesterfield County's raw water impoundment dam.	III B	
6c	Swift Creek and its tributaries from Chesterfield County's raw water impoundment dam to a point 5 miles upstream.	III A	Public Water Supply

Section	Basin and Section Description	Class	Special Standards
	<u>James River, Cont'd.</u>		
6d	That portion of Old Town Creek within the corporate limits of Colonial Heights.	III B	
6e	Appomattox River and its tributaries from Petersburg's raw water intake to the headwaters of the Appomattox Water Authority impoundment lake.	III B	Public Water Supply
6f	Buffalo Creek from Farmville's raw water intake to a point 5 miles upstream.	III A	Public Water Supply
7	Free Flowing tributaries to the James River from Brandon to the fall line at Richmond, unless otherwise designated.	III A	
7a	Falling Creek and its tributaries from Bellwood Defense General Depot's raw water intake to a point 5 miles above Chesterfield County's raw water intake.	III A	Public Water Supply
8	James River and its tributaries from the low water dam above 14th Street Bridge to Richmond's raw water intake at Williams Island Dam.	III B	
9	James River and its tributaries, unless otherwise designated, from Richmond's raw water intake at Williams' Island Dam to a point 5 miles above Richmond's raw water intake at Bosher's Dam.	III B	o Public Water Supply
9a	Tuckahoe Creek from its confluence with the James River to its headwaters.	III B	n Public Water Supply
10	James River and its tributaries from a point 5 miles above Richmond's raw water intake at Bosher's dam to and including the Rockfish River, unless otherwise designated.	III A	
	<u>Trout Waters in Section 10:</u>		
	Put and Take:	V A	
	Ivy Branch 1.5 miles upstream from the church above the junction of routes 628 and 614.		
	Swift Run from route 604 upstream 2.5 miles to route 810		
	South Fork Moormans River from its confluence with Moormans River to its headwaters		
	North Fork Moormans River from its confluence with Moormans River to its headwaters		



Section	Basin and Section Description	Class	Special Standards
	<p>South Fork Rockfish River from its confluence with the Rockfish River to its headwaters</p> <p>Stony Creek from its confluence with the South Fork Rockfish River to its headwaters</p> <p>Rockfish Creek from its confluence with the South Fork Rockfish River to its headwaters</p> <p>Natural:</p> <p>Ivy Branch from route 810 to headwaters</p> <p>Swift Run from Albemarle Co. line to headwaters</p>	VI A	
10a	James River and its tributaries from and including Little River to 5 miles above State Farm's raw water intake including Beaverdam and Courthouse Creeks to their headwaters.	III A	Public Water Supply
10b	Deep Creek from St. Emma's Military Academy's raw water intake to a point 5 miles upstream.	III A	Public Water Supply
10c	Willis River and its tributaries within Cumberland State Forest.	III B	
10d	Johnson Creek above Alberene Stone Corporation's raw water intake to its headwaters.	III A	Public Water Supply
10e	Totier Creek and its tributaries from Scottsville's raw water intake to their headwaters.	III A	Public Water Supply
10f	Powell Creek from its confluence with the Rivanna River upstream to its headwaters.	III B	
10g	Beaver Creek above Albemarle County Service Authority's raw water intake upstream to its headwaters.	III A	Public Water Supply
10h	Mechum River and its tributaries from Charlottesville's raw water intake to a point 5 miles upstream.	III A	Public Water Supply
10i	Moorman River from Charlottesville's raw water intake to its headwaters.	III A	Public Water Supply
10j	South Fork Rivanna River and its tributaries, except Ivy Creek, from Charlottesville's South Fork Rivanna River Dam to the confluence of the South Fork Rivanna River and Moorman River, and Ivy Creek to a point 5 miles above the dam.	III A	Public Water Supply
10k	James River and its tributaries from Fork Union Sanitary District's raw water intake (just below the route 15 bridge) to a point 5 miles upstream, including the Slate River to a point 5 miles	III A	Public Water Supply

Section	Basin and Section Description	Class	Special Standards
	above the intake. JAMES RIVER BASIN (UPPER) (10)		
11	James River and its tributaries from, but not including, the Rockfish River to, but not including, the Maury River. <u>Trout Waters in Section 11:</u> Natural: Enchanted Creek from its confluence with the Pedlar River upstream to its headwaters Irish Creek from its confluence with the Pedlar River upstream to its headwaters Pedlar River from 5 miles above Lunchburg's raw water intake upstream to its headwaters Mill Creek from its confluence with the Pedlar River upstream to its headwaters Staton Creek from its confluence with the Pedlar River upstream to its headwaters Piney River from a point 5 miles above American Cyanamid's raw water intake upstream to its headwaters North Fork Buffalo River from its confluence with the Buffalo River upstream to its headwaters Tye River from Tyro upstream to its headwaters North Fork Tye River from its confluence with the Tye River upstream to its headwaters	III A  VI A	
11a	Rutledge Creek from Sweet Briar College's raw water intake to its headwaters.	III A	Public Water Supply
11b	Buffalo River and its tributaries from Amherst's raw water intake to a point 5 miles upstream.	III A	Public Water Supply
11c	Piney River and its tributaries from American Cyanamid Company's auxiliary raw water intake to a point 5 miles upstream. <u>Trout Waters in Section 11c:</u> Natural: Piney River from American Cyanamid's raw water intake to a point 5 miles upstream	III A  VI A	Public Water Supply

Section	Basin and Section Description	Class	Special Standards
11d	James River and its tributaries from a point $\frac{1}{2}$ mile above the confluence of the Buffalo River to Six Mile Bridge.	III A	g
11e	James River and its tributaries excluding Blackwater Creek from Six Mile Bridge to Scotts Mill Dam.	III B	
11f	Ivy Creek from Blue Ridge Farm's (Campbell County) raw water intake to a point 5 miles upstream.	III A	Public Water Supply
11g	James River and its tributaries from Scotts Mill Dam to Reusens Dam to include Madison Heights' raw water intake on Harris and Graham Creeks.	III B	Public Water Supply
11h	James River and its tributaries, excluding the Pedlar River, from Reusens Dam to Coleman's Dam.	III B	d Public Water Supply
11i	Pedlar River and its tributaries from Lynchburg's raw water intake to a point 5 miles upstream.	III A	Public Water Supply
	<u>Trout Waters in Section 11i:</u>		
	Natural:	VI A	
	Pedlar River from Lynchburg's raw water intake to a point 5 miles upstream		
	Brown's Mill Creek from its confluence with the Pedlar River upstream to its headwaters		
11j	James River and its tributaries from the Owens-Illinois raw water intake near Big Island, to, but not including, the Maury River.	III B	
	<u>Trout Waters in Section 11j:</u>		
	Put and Take:	V B	
	Hunting Creek from its headwaters to a point 2 miles downstream		
	Battery Creek from its headwaters to a point 2 miles downstream		
	Natural:	VI B	
	Rocky Row Run from the telegraph line above Snowden to its headwaters		
12	James River and its tributaries from and including the Maury River to its headwaters unless otherwise designated.	IV A	



Section	Basin and Section Description	Class	Special Standards
	<p>Clayton Mill Creek from its junction with route 600 to its headwaters</p> <p>Jerkentight from its confluence with the Calfpasture River to its headwaters</p> <p>Ramsey's Draft from its confluence with the Calfpasture River to its headwaters</p> <p>Fridleys Branch from its confluence with the Calfpasture to its headwaters</p> <p>St. Marys River from route 606 to its headwaters</p> <p>Little Mill Creek from its confluence with the Maury River to route 39</p> <p>Little Back Creek from route 600 to its headwaters</p> <p>Wilson Creek from Douthat State Park to its headwaters</p> <p>Muddy Run from route 220 to its headwaters</p> <p>Smith Creek from its confluence with Wilson Creek to its headwaters</p> <p>Mares Run from its junction with route 39 at Bath Alum to its headwaters</p> <p>Cedar Creek from its confluence with the Jackson River to its headwaters</p> <p>Pads Creek from its junction with routes 42 and 630 to its headwaters</p> <p>North Creek from its confluence with Jennings Creek to its headwaters</p> <p>Middle Creek from its confluence with Jennings Creek to its headwaters</p> <p>Cornelius Creek from its confluence with Jennings Creek to its headwaters</p> <p>Hypes Creek from route 696 to its headwaters</p> <p>Sinking Creek from Route 697 to its headwaters</p> <p>Madison Creek from route 682 to its headwaters</p> <p>Crab Run from its confluence with Bullpasture River to its headwaters</p> <p>Davis Run from route 678 to its headwaters</p>		

Section	Basin and Section Description	Class	Special Standards
12a	<p>Barbours Creek from the junction of routes 611 and 617 to its headwaters</p> <p>Cove Creek from its confluence with Craig Creek to its headwaters</p> <p>Lick Branch from its confluence with Craig Creek to its headwaters</p> <p>Broad Run from its junction with routes 311 and 618 to its headwaters</p> <p>Elk Creek from route 799 to its headwaters (1.5 miles)</p> <p>Brattons Run from its confluence with the Maury River to its headwaters</p> <p>Guys Run from its confluence with the Maury River to its headwaters (3.6 miles)</p> <p>Maury River and its tributaries, unless otherwise designated, from U. S. Route 60 Bridge to its confluence with the Little Calfpasture River.</p> <p><u>Trout Waters in Section 12a:</u></p> <p>Put and Take:</p> <p>Hays Creek from its confluence with the Maury River to Brownsburg (9.5 miles)</p> <p>Irish Creek from its confluence with the South River to its headwaters (along route 603 - 9 miles)</p> <p>Natural:</p> <p>Big Mary's Creek from its confluence with the South River to its headwaters</p> <p>Laurel Run from its confluence with the Maury River to its headwaters (2 miles)</p> <p>Mill Creek from its confluence with the Maury River to its headwaters</p>	<p>IV B</p> <p>V B</p> <p>VI B</p>	
12b	Maury River and its tributaries from Lexington's raw water intake to a point 5 miles upstream.	IV A	Public Water Supply
12c	Black Run from Craigsville's raw water intake to its headwaters.	IV A	Public Water Supply

Section	Basin and Section Description	Class	Special Standards
12d	Moore's Creek located on Brushy Mountain.	IV A	Public Water Supply
12e	Cowpasture River from the Alleghany-Botetourt County line upstream to U. S. Route 60 bridge.	IV B	
12f	Smith Creek and Clifton Forge Reservoir from Clifton Forge's raw water intake to their headwaters.	IV A	Public Water Supply
	<u>Trout Waters in Section 12f:</u>		
	Natural:	VI A	Public Water Supply
	Smith Creek from 4 miles north of Clifton Forge Route 606 to its headwaters		
12g	Mill Branch located on Horse Mountain.	IV A	Public Water Supply
12h	Potts Creek and its tributaries from Hercules Incorporated's raw water intake to a point 5 miles upstream.	IV A	Public Water Supply
12i	Dunlop Creek and its tributaries from the Covington Boys' Home's raw water intake to a point 5 miles upstream.	IV A	Public Water Supply
12j	Jackson River and its tributaries from Covington's raw water intake to a point 5 miles upstream.	IV A	Public Water Supply
12k	Roaring Run above Clearwater Park's raw water intake to its headwaters.	IV A	Public Water Supply
12l	Unnamed tributary to the James River from Glen Wilton's raw water intake to its headwaters.	IV A	Public Water Supply
12m	Unnamed tributary to the James River from Eagle Rock's raw water intake to its headwaters.	IV A	Public Water Supply

## KEY TO SPECIAL STANDARDS

- a. In those sections of Class IA, IB, IIA and IIB waters within this State where leased private, or public shellfish beds are present, the following bacterial standards shall be established in addition to other bacterial standards adopted for the protection of primary or secondary recreation:

Coliform organisms - The median MPN shall not exceed 70/100 ml, and not more than 10% of the samples ordinarily shall exceed an MPN of 230/100 ml for a 5-tube decimal dilution test (or 330/100 ml, where a 3-tube decimal dilution is used) in those portions of the area most probably exposed to fecal contamination during the most unfavorable conditions.

In addition, the shellfish area is not to be so contaminated by radionuclides, pesticides, herbicides or fecal material so that consumption of the shellfish might be hazardous.\*

- b. Temperature standard to be established for lakes and impoundments receiving thermal discharges:

In lakes and reservoirs, the temperature of the epilimnion, in those areas where important organisms are most likely to be adversely affected, shall not be raised more than 3°F. above that which existed before the addition of heat of artificial origin. The increase is to be based on the monthly average of the maximum daily temperature. Unless a special study shows that a discharge of a heated effluent into the hypolimnion (or pumping water from the hypolimnion for discharging back into the same water body) will be desirable, such practice shall not be approved.

- c. Maximum temperature shall be 81°F., unless caused by natural conditions; the maximum rise above natural temperatures shall not exceed 5°F.
- d. Chlorides not to exceed 800 mg/l at any time.

\* Based on National Shellfish Sanitation Program Manual of Operations



- e. Chlorides not to exceed 40 mg/l at any time.
- f. Chlorides not to exceed 8000 mg/l at any time.
- g. Radiation standard:
  - 1. radium-226 not to exceed 3 pc/l  
strontium-90 not to exceed 10 pc/l
  - 2. in the known absence of strontium-90 and alpha-emitting radionuclides, gross beta activity not to exceed 1,000 pc/l
  - 3. if the gross beta activity is in excess of this amount, a more complete radiochemical analysis is required to determine that the sources of radiation exposure are within the limits of the Radiation Protection Guides.
- h. Objective for Nutrients - The cumulative total of nitrogen as N from all sources in the effluent shall not be greater than 0.5 mg/l at any time; phosphorus as P from all sources in the effluent shall not be greater than 1.0 mg/l at any time.
- i. The State Water Control Board has directed and/or ordered the following:
  - 1. That all existing discharges in accordance with h above shall substantially remove the nutrients in their effluents on or before such time as central facilities (The Hampton Roads Sanitation District Commission Chesapeake-Elizabeth System) become available or connect to central facilities, (i.e. The Chesapeake-Elizabeth System).
  - 2. That it will consider approving small discharges to this watershed to facilitate the elimination of potential public health hazards provided central facilities (Chesapeake-Elizabeth System) are not available, and
  - 3. That it will not allow additional significant new discharges to this watershed, which do not provide for nutrient removal facilities in accordance with h above.
- j. The following, from Minute 73 of the proceedings of the Board at its meeting on July 11-12, 1966, will also apply:

For discharge to the Chickahominy River and its tributaries below Bottoms Bridge, effluent quality obtainable with conventional secondary sewage treatment plants with approved plans is acceptable, except that the following specifications shall be met:

Constituent	Analysis Schedule	Concentration
1 Coliform Organisms	Every 3 hrs every other day	Most probable number median of 100 per 100 ml with no greater than 10% of the samples to exceed 1000 per 100 ml
2 Inorganic Nutrients	Once/week on a composite sample	Nitrate (as N) not to exceed .5 ppm. Total phosphate(as $\text{PO}_4$ ) not to exceed 1.5 ppm
3 Other Physical and Chemical Constituents	Other physical or chemical constituents not specifically mentioned will be covered by additional specifications as conditions detrimental to the streams arise. The specific mention of items 1 and 2 does not necessarily mean that the addition of other physical or chemical constituents will be condoned.	

In lieu of the above requirements, conventional secondary sewage treatment plants may ordinarily be used anywhere in the Chickahominy River Basin, provided holding ponds, capable of retaining the entire plant effluent during low flow critical conditions, are constructed. "Low flow" is construed to mean less than 15 cubic feet per second in the main stem of the Chickahominy River itself at the (1) point of waste discharge to the main stem, or (2) confluence of a tributary below the point of waste discharge to the tributary. Below Bottoms Bridge, holding ponds with at least 60-day retention capacity (August 14 to October 13) may be required, if in the opinion of the Board's staff it is deemed necessary.

- k. The following from Minute 73 of the proceedings of the Board at its meeting on July 11-12, 1966, will also apply:

Constituent	Analysis Schedule	Concentration
1 Dissolved Oxygen	Once/2 hr, 24 hr/day, 7 days/wk on grab samples	7.5 ppm (90% sat. at 25°C) average during the day, with no individual sample less than 6.7 ppm (80% sat. at 25° C)
2 Bio-chemical Oxygen Demand 5-day at 20° C	Once/24 hr on composite sample (how collected) 7 days/week	6.0 ppm average, with not more than 5% of individual samples to exceed 8.0 ppm
3 Settleable Solids	Same as for Dissolved Oxygen	Not to exceed 0.1 ml/liter
4 Suspended Solids	Same as for bio-chemical oxygen demand	5.0 ppm average, with not more than 5% of individual samples to exceed 7.5 ppm
5 Ammonia Nitrogen	Same as bio-chemical oxygen demand on specially preserved samples	Not to exceed 2.0 ppm as N
6 Residual Chlorine	Same as for dissolved oxygen but once every hour	As required to meet MPN specifications and prevent damage to aquatic life in streams
7 Coliform Organisms	Every 4 hours, every other day	Most Probable Number Median of 100 per 100 ml with no greater than 10% of the samples to exceed 1000 per 100 ml
8 pH	Same as for dissolved oxygen	Not less than 6.0 and not greater than 8.0
9 Inorganic Nutrients	Once/week on a composite sample	Nitrate (as N) not to exceed .3 ppm, total phosphate (as PO <sub>4</sub> ) not to exceed .6 ppm (mean values in the Chickahominy)

Constituent	Analysis Schedule	Concentration (Cont'd)
10 Other Physical and Chemical Constituents	Other physical or chemical constituents not specifically mentioned will be covered by additional specifications as conditions detrimental to the stream arise. The specific mention of items 1 through 9 does not necessarily mean that the addition of other physical or chemical constituents will be condoned.	

In lieu of the above requirements, conventional secondary sewage treatment plants may ordinarily be used anywhere in the Chickahominy River Basin, provided holding ponds, capable of retaining the entire plant effluent during low flow critical conditions, are constructed. "Low flow" is construed to mean less than 15 cubic feet per second in the main stem of the Chickahominy River itself at the (1) point of waste discharge to the main stem, or (2) confluence of a tributary below the point of waste discharge to the tributary. Above Bottoms Bridge the holding ponds are to retain the entire plant effluent for at least 90 days (July 15 to October 13).

1. The following, from Minute 1 of the proceedings of the Board at its meeting on July 20-21, 1965, will also apply:
2. All known existing treated discharges containing bacteria shall be chlorinated sufficiently and continuously (100% of the time) to maintain a residual which will insure substantially complete removal of coliform organisms. This action is to be instituted immediately by all concerned owners.
3. All owners now discharging industrial wastes and sewage shall install facilities which will provide the maximum possible degree of biochemical oxygen demand (B.O.D.) removal; in addition, the effluent from such facilities shall contain a minimum of 5 mg/l of dissolved oxygen (D.O.).
4. All owners in the area (City of Suffolk, County of Nansemond, industrial establishments and individuals) shall immediately take steps to collect and treat, in accordance with items 2 and 3 above, the wastes that are now being discharged untreated either directly or indirectly to the River and Shingle Creek and which now constitute a health hazard to the area.
5. The City of Suffolk, the County of Nansemond, and those private owners who are now discharging sewage and industrial wastes to these waters are to immediately initiate programs to formulate a plan, or alternative plans, for improving water quality in the River and Shingle Creek. Alternative plans may include conveying

all wastes completely from out of this watershed for treatment and/or disposal. Only under exceptional circumstances will additional discharges of treated wastes into these waters be permitted.

- m. Zinc (total) not to exceed 0.5 mg/l at any time.
- n. The following from Minute 32 of the proceedings of the Board at its meeting on September 13, 1960, will also apply:

The concentration and total amount of impurities in Tuckahoe Creek and its tributaries of sewage origin shall be limited to those amounts from sewage, industrial wastes, and other wastes which are now present in the stream from natural sources and from existing discharges in the watershed.

- o. The following, from Minute 38 of the proceedings of the Board at its meeting on March 30, 1955, will also apply:
  - 1. No sewage discharges, regardless of degree of treatment, should be allowed into the James River between Boshers' and Williams Island Dams.
- p. The following criteria from Minute 59 of the proceedings of the Board at its meeting on May 17-18, 1966, (amended April 8, 1970), will be applied to proposals for sewage treatment facilities which will discharge effluent to Williams and Upper Machodoc Creeks, King George County:
  - 1. If raw sewage stabilization ponds are proposed, they shall be followed by a 15-day holding pond and chlorination facilities in duplicate;
  - 2. If "conventional" sewage treatment facilities are proposed, they shall effect at least 85% removal of B. O. D. and shall be followed by a 15-day holding pond and chlorination facilities in duplicate;
  - 3. Chlorination facilities are to be operated continuously during the entire year and chlorine residual of at least 2.0 ppm shall be maintained at all times;
  - 4. In sewerage systems where pumping stations are found to be necessary, they shall be designed to prevent the discharge of raw sewage to State waters;
  - 5. If, in the opinion of the staff, following consultation with the State Department of Health it is determined that more satisfactory water quality can thereby be maintained in

preceded by adequate pilot studies and that any such construction be in accordance with design backed up by such pilot study information and,

- (d) each owner was to understand that nutrient removal facilities might not prevent eutrophication and other problems in the Occoquan impoundment and that in such cases each owner is to take such additional steps as are necessary to correct the situation.

- (2) Although it was willing to allocate that 25,000 population among the contending political subdivisions, all affected political subdivisions are to submit an acceptable, agreeable distribution of the 25,000 population minus a 6,000 population allocation granted to the Town of Warrenton as contained in Minute 57 from the proceedings of this meeting."  
(Reference Minute 56--March 28, 1967.)

- s. The following, from Minute 20 of the proceedings of the Board at its meeting on January 16, 1969, will also apply to the Powhatan Creek Watershed:

- 1. All proposals for treated waste discharges to the Powhatan Creek Watershed will in the future be approved only after:
  - (a) Engineering data has been submitted indicating the capability of the proposed treatment facilities to remove all phosphorus and nitrogen compounds.
  - (b) Owners with facilities existing at the time of this action will, in a period not to exceed 60 days, submit to the Board, engineering reports and pollution abatement schedules indicating the maximum concentrations of phosphorus and nitrogen compounds which they can remove from waste waters prior to discharge. No schedule providing a time period exceeding three years will be approved. Modification or replacement of existing treatment facilities may be necessary.
- 2. It will entertain from owners in the area a proposal for development of:
  - (a) A central facility to treat all wastes at a point outside the Watershed, where phosphorus and nitrogen removal will probably not be necessary, or
  - (b) Treatment facilities inside the Watershed which include complete removal of all phosphorus and nitrogen compounds.

3. If the above plan is accompanied by a firm schedule leading to completion of sewage treatment facilities within a reasonable length of time, and it can be demonstrated that the financing for the facilities is available, the Board will consider allowing interim construction of sewage treatment facilities in the Powhatan Creek Watershed without the requirement of phosphorus and nitrogen compound removal.